4.0 Nursing Staff Turnover and Retention in Nursing Homes[1]

4.1 Introduction

The "appropriateness" of establishing minimum nurse staffing ratios, the central policy issue of this Congressionally-mandated report, cannot be inferred solely from empirical studies demonstrating a strong relationship between critical staffing ratio thresholds and resident outcomes. Of course, if no such relationship is found or if the evidence is ambiguous, then the policy issue becomes moot. As we have seen in Chapter 2 and Chapter 3, the evidence supporting the existence of these critical thresholds is strong and compelling. But, as we have also noted, there are other issues relevant to a consideration of "appropriateness." Among these issues there is, first, the question of whether these staffing thresholds can or should be adjusted for case mix. Second, there is the question of whether the existing nurse staffing data are sufficiently accurate for determining compliance with any nurse staffing requirement that might be implemented (see Chapter 9). Third, there is the issue of the cost of higher staffing levels and how the current public payment systems, Medicare and Medicaid, need to be modified to support improved staffing (see Chapter 11). All these issues are examined extensively in the above cited chapters.

Perhaps the strongest argument against establishing minimum staffing ratio requirements is that there is currently such a sufficiently severe shortage of nursing personnel – RNs, LPNs, Aides – that a mandated requirement could never be implemented, whatever the merits of higher staffing levels.[2] In general, studies point to the increased demand for long term care nursing created by the aging of the population and the constrained supply of nursing personnel to meet the demand. A number of specific factors differentially impact the licensed, particularly the RNs, workforce. The demand for RNs is likely to greatly increase over the next three decades when current baby boomers reach retirement. During the same period, the projected supply of RNs is expected to fall 20% below predicted requirements (Buerhaus, et al, 2000). The average age of the current RN workforce has continued to rise, and enrollment of basic nursing programs has steadily fallen, due in part to the increased

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[1] This chapter and the next, while important to this Phase 2 Report to Congress on the appropriateness of minimum staffing ratio requirements, fulfills a separate Congressional requirement of a report on staff retention in long term care facilities. The research strategy for this project was developed by Marvin Feuerberg, CMS, who also wrote sections 4.1, 4.2, and 4.8. Alan White, Abt Associates, wrote sections 4.3 – 4.7. Susan Eaton, Harvard University, wrote the next chapter in its entirety.

[2] Although the discussion of the nursing workforce in this introductory section is generic, encompassing nursing in both acute and long-term care settings, it is recognized that the factors affecting demand and supply of nursing will differentially impact specific care settings. The subsequent sections discussing turnover and retention will be limited to that currently found in nursing homes, particularly nursing assistants. It also is limited to what is usually viewed as the direct care staff, and does not address the impact of widely acknowledged problems in turnover and retention of nursing home Administrators and Directors of Nursing.

expansion of career opportunities for women outside of nursing. If these trends continue, the RN workforce will begin to decline as the aging RNs retire.

Unlike the licensed nursing staff who must complete educational and special training programs that range from 12- to 18 months preparation for LPNs or 2 - 4 years for RNs, the paraprofessional long-term care workers are not required to complete any program to become a nursing assistant (NA).[3] As noted by Callahan (2001), most of the paraprofessional workforce, including NAs, ". . . work in what economists call a 'secondary' labor market. It is one characterized by 'low wages and fringe benefits, poor working conditions, high labor turnover, little chance of advancement, and often arbitrary and capricious supervision.' Current data recently assembled by the GAO (2001), indicates that compared to the workforce in general, ". . . nurse aides are more likely to be female, non-white, unmarried, . . with children at home. . . uninsured, living below the poverty level, and receiving public benefits such as food stamps and Medicaid."

One important consequence of NAs being drawn from this secondary labor market with few educational/training prerequisites for entry is that the factors affecting the supply of workers are different in many respects from that impacting the shortage of licensed nursing. Specically, NAs and other long term care givers are impacted by welfare policies, and prevailing wages and employment conditions in other competing low-wage service sectors (Banaszak-Holl and Hines, 1996; Pennsylvania Intra-Governmental Council on Long Term Care, 2001). Further evidence on the general prevalence of the problem is found in a recent state survey. Forty-two of 48 responding states (88 percent) indicated that turnover and retention were an issue in their state and two-thirds had taken some action to address the nurse aide issue.[4] In general, the current shortage of NAs during the last few years has been has been due to a robust economy and historically low unemployment.

The nursing workforce shortage problem and related issues are examined more extensively in Chapter 8 and in several published research studies noted above. (See also, AHCA, 2001; IOM, 1996; IOM, 2001).

4.1.1 Relationship between Nursing Workforce Shortage, Turnover/Retention Problems, and Quality of Care

In addition to the evidence of a future projected shortage of nursing personnel, described above, widespread reports by nursing homes and the industry of difficulties in filling vacancies as well as very high turnover rates provide evidence of a currently acute shortage.

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[3]   However, once on the job, nursing assistants must complete a very limited training program and pass a competency examination to become "certified nursing assistants" (CNAs). These training programs are discussed at length in Chapter 7.

[4]   See Appendix B, "Results of a Follow-Up Survey to States on Wage Supplements for Medicaid and Other Public Funding To Address Recruitment and Retention in Long-Term Care Settings," (North Carolina Division of Facility Services, November 4, 2000.

For example, a recent survey of Pennsylvania's long term care facility and agency administrators found that across the state, 13 percent of providers reported vacancy rates of paraprofessional direct care workers exceeding 20 percent; 19 percent of privately operated nursing homes reported vacancy rates greater than 20 percent (Pennsylvania Intra-Governmental Council on Long Term Care, 2001). This general pattern of shortage is more pronounced for nursing homes that have lower wage rates for RNs, LPNs, and NAs than hospitals (AHCA, 2001). It is generally presumed that the current shortage creating a demand for nursing personnel in turn increases the difficulty of nursing homes in retaining staff which, in turn, increases turnover.

Nursing home quality is also negatively impacted by these labor force dynamics. To the degree that staffing levels are lower than they would be in the absence of a shortage, then resident care is adversely impacted, particularly if staffing fall below critical thresholds (see chapter 2 and chapter 3). Even holding staffing levels constant, it has been argued that high turnover/low retention of nursing staff negatively impacts resident quality. Although there is an absence of studies documenting this relationship, there does appear to be a reasonable rationale for thinking that turnover may impact resident quality. Advocates maintain that high turnover reduces the daily flow of information and familiarity with the resident and the continuity of care. This rationale would particularly apply to NAs who provide the vast majority of hands-on care. And turnover rates of all nursing personnel appear to be extremely high, as will be discussed below.

4.1.2 Purpose

This chapter on nursing turnover and retention together with other chapters in this report on management practices and training highlight staffing dimensions other than sheer numbers or ratios of staff that importantly impact nursing home quality of care. Specifically, this chapter will: (1) review selected published research on what is known about nursing staff turnover and retention; (2) present a quantitative analysis of newly available data on the factors contributing to turnover; and (3) review the policy responses to the problems presented by the currently high rate of nursing turnover.

4.2 Review of Selected Research on Nursing Staff Turnover and Retention in Nursing Homes

4.2.1 How Much Turnover and Retention is There?

This seems like a simple question, but it is very difficult to give a precise answer. First, there is a definitional issue of how turnover and retention are defined. Although the precise operational definitions differ somewhat from survey to survey, conceptually they are quite distinct. Most broadly, turnover rates for a given category of workers are "usually expressed as a percentage and are computed by dividing all of an organization's new hires in a given time period (usually one year) by their average number of positions during that time period (Atchley, 1996)." Different survey instruments may make a further distinction between part-

time and full-time employees by calculating separate rates. Still others make a distinction in the denominator between the average number of filled positions and a total number of positions including vacancies. In addition, most of the concern with turnover has been with voluntary terminations rather than involuntary. Turnover that results from the termination of employees who are fired because of poor performance (e.g., abuse of residents) would normally be viewed as positive. Unfortunately, the usual data sources do not make the distinction between voluntary and involuntary terminations.

In contrast, retention rates, sometime referred to as stability or continuity rates, are usually expressed as a percentage and calculated by dividing the number of employees who have been employed by the organization for some period of time (usually one year) divided by the number of employees at the beginning. Other less frequently generated measures of stability could also be generated. For example, an average length of stay could be computed by dividing the total years of service of all employees by the total numbers of employees. Although there can be distinctions in the precise definitions of turnover and retention (stability), it is important to note that once defined, the two rates are conceptually very different and capture very different labor force dynamics. Although it might be expected that high turnover rates would be accompanied by low retention rates, this is not necessarily true. For example, it is possible for an organization to have a relatively high turnover rate represented by a high turnover of a portion of their staff while a large portion of their staff remains over the period in question (again, usually one year).

A more serious obstacle to determining the degree of turnover and retention is not definitional, but rather the absence of national reporting. Unlike the continuous census of nurse staffing in certified nursing homes provided by CMS' (formerly HCFA) OSCAR system or the relatively infrequent national representative sample surveys,[5] there is no current census or nationally representative sample survey of turnover and retention among nursing homes. The typical data sources for estimating turnover and retention are individual, small-scale studies, usually limited to some subset of responding facilities within a single state, often predating the recent concern with turnover and retention. Recently, however, a few states have collected data on turnover and retention in special surveys and/or their Medicaid cost reports. These data provide an opportunity for a facility-level analysis of all or nearly all facilities in the states. Accordingly, we were able to obtain newly available data on nursing staff turnover and retention for three states and conduct an analysis which is presented in Section 4.3 - 4.7 below.

Apart from the absence of national reporting, the most serious problem in determining the degree of turnover and retention is the accuracy of the data that are reported. There are several reasons to doubt the accuracy of these data. First, in many of the small-scale studies, sampled respondents are asked to report their turnover rate. In one study the correlation between the organizations' computed turnover rate for nurse aides and the investigators

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[5] See Phase 1 Report, Chapter 3.

computed rate (from data elements also reported by the facility) was only a very low .33 (Straker and Atchley, 1999). In another study, the correlation between turnover of nurse aides reported by Administrators and Directors of Nursing (DON) was higher (.79), but it is difficult to know if these estimates from the respondents are truly independent. [Also, estimates were for a six-month period, which might produce more accurate results than the recall period of the more commonly used time period of one year.]. More direct evidence of accuracy problems is illustrated by inconsistencies in the data examined in Section 4.3 - 4.7 below.

Finally, as examined at length in Chapter 9, it may be difficult for nursing homes to report accurately their staffing levels and other staffing characteristics, including turnover and retention, because their normal record keeping is not set up for this task. The data elements are there, but often in several different places/records, and the facility respondent may not be the most knowledgeable person in the use of these records.

4.2.2   Summary – How Much Turnover and Retention is There?

Due to the absence of nationally representative reporting and the doubts about the accuracy of the data that are reported, precise estimates of turnover and retention are not available. In addition, few studies reporting turnover are accompanied by retention estimates. This current situation may improve if more states require reporting of these data in annual surveys, Medicaid cost reports, or if these data are required in new Federal reporting requirements, either as additional reporting or a replacement for the staffing section of the current OSCAR system. To the degree that facilities are periodically required to report these data, it is reasonable to presume that they will become familiar with the definitions, and develop record keeping to facilitate more accurate reporting.

Although precise national estimates are not possible, some very important things are known. First, all studies produce estimates of turnover that are relatively high. In a number of studies examined by AHCA (2000), the average turnover rate of nurse aides in nursing homes ranged between 38 percent and 143 percent; average turnover rates for LPNs ranged between 27 and 61 percent; and the average turnover rate for RNs ranged between 28 and 59 percent. Second, although the average turnover rates are high, there appears to be considerable variation among reporting facilities not only within a state, but among nursing homes within the same labor markets. Further evidence is provided below in Section 4.3 - 4.7.

4.2.3   What are the Factors Contributing to Turnover?

Typically, the purpose of the data collection on turnover is to investigate the factors that impact or are impacted by turnover; that is, with a few exceptions, the primary purpose of these studies is not solely to estimate turnover and retention. However, given the above description of the limitations of the typical data collection on turnover, it is not surprising that the studies in turn are also limited. Up until recently, staffing, including staffing levels and turnover, has not been a central concern of policy makers and health service researchers.

Consequently, the currently available research is also limited,[6] particularly qualitative studies that require reasonable samples. We think the analysis of newly available data presented in the next section is an improvement on this situation. However, given the general inadequacy of data for quantitative analysis, sound qualitative studies may provide more information on turnover processes, even if generalizations are limited. One such study is presented in chapter 5 below.

Although there are many alternative ways of conceptualizing the types of factors affecting turnover, particularly voluntary turnover, they can be generally divided into internal and external factors. The internal factors are those characteristics of the job that may motivate an individual to leave (push factors, e.g., low pay/benefits, stressful work, lack of promotion opportunity) in contrast to the external factors (pull factors) that are external to the job (e.g., opportunity for better job, family responsibilities). Of course, the salience of any particular factor for an individual will also be dependent on characteristics of the individual, including age, gender, education, training, work and other experience, family background, personal goals, etc. No one study can examine all these factors/variables, and the dependent variable, turnover, is subject to considerable measurement error.

For RNs working in nursing homes, the GAO (2001) noted that ". . . recent surveys of nurses have found decreased job satisfaction, and a high portion of respondents have reported increased pressure to accomplish work, the need to work overtime, and stress-related illness . . . job dissatisfaction is a primary reason for nurse retention problems. To these "push" factors in the retention equation must be added the general shortage due to the increased demand by an aging population and the shrinking supply of RNs, as noted above. Also, licensed staff working in nursing homes on average improve their wage rates by moving to a hospital setting (AHCA, 2001). The importance of other factors such as wages and benefit levels, facility staffing levels, facility characteristics, and local labor market conditions are discussed in Section 4.6 below.

4.2.4 Nursing Assistant Turnover

The "bed and body" work of nursing assistants is hard, stressful, highly injurious, often unpleasant work for relatively low pay, benefits, or recognition (Diamond, 1992). Although the work is often characterized as unskilled, it requires a high level of personal organizational skills to complete all (or even a substantial portion) of required tasks under the typical conditions of short staffing and absenteeism (Bowers and Becker, 1992). Hence, it is not surprising that there is extremely high turnover of nursing home NAs due to the "pull" of other opportunities, particularly with a robust economy and the low unemployment levels during the past 8 years. Put bluntly: "Ironically, while these [frontline] workers are

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[6] The problems in securing adequate data on staffing levels in nursing homes are discussed in Chapters 3, 7, and 8 of the Phase 1 Report (HCFA, 2000); Inadequate nurse staffing data has also posed a serious problem in a recent comprehensive study of nurse staffing and patient outcomes in hospitals (Needleman, et al, 2001).

delivering essential care to some of the most vulnerable segments of our population, their peers 'flipping burgers at McDonalds' make more, have much more financial security, and are treated with much more respect" (Stone, 2001).

Some indication of where these workers go is found in an on-going longitudinal study of all those individuals who were certified as having completed, at any time after 1990, the training for Nursing Assistant 1 (an entry level classification). The study found that "less than half of the 180,000 North Carolinians trained to work as nursing assistants during the last decade are currently certified to work as a nurse aide. Even among those who are certified, many apparently work only part-time as a nurse aide and supplement this income with earning from other unrelated jobs in low wage industries," including retail sales, eating and drinking establishments, manufacturing, and transportation (Konrad, no date).[7] Evidence of the importance of these external local labor market factors has been discussed above and further evidence is provided in Section 4.6 below.

A recent review (Bowers, et al, 2001) of CNA turnover studies identified a number of organizational characteristics, external to the individual, as contributing to turnover: " . . . highly centralized, authoritarian management style which leave little room for CNAs to make care suggestions; . . .restricted chances for advancement . . . inadequate training or orientation, inadequate resources to provide care (including chronic understaffing); . . . lack of opportunity to contribute to care planning, and lack of acknowledgement or reward for good work." Unfortunately, the studies do not yield a consistent explanation of turnover. For example, the often cited study by Banaszak-Holl and Hines (1996) found that the intensity of work demands did not have the expected effect on the rate of nurse aide turnover. Similarly, increased aide training did not lead to decreases in turnover. Nor did a primary resident assignment have a significant effect. Banaszak-Holl and Hines suggest that if training is linked to changes in job structure to increase work autonomy and better career opportunities, it might lead to lower turnover. Similarly, they suggest that if a primary resident assignment were accompanied by greater autonomy in dealing with the resident, then turnover by be thereby reduced.

Taken as a whole, the central problem with the usual studies is that it is difficult to arrive at a consistent and compelling explanation or even a more satisfying understanding of turnover. An alternative approach is found in the recent study by Bower et al (2001). Utilizing a methodology that permits the CNAs themselves to explain not only what factors are important in their decisions to leave their jobs, but how these factors influence their

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[7] This on-going study linked North Carolina's Nurse Aide Registry with wage and occupational information contained in the North Carolina Common Follow-up System maintained by the Department of Labor. Of course, there are limits as to what can be inferred from the quantitative analysis of movement in and out of certification. Explanations of turnover of those CNAs who have allowed their CNA registration to lapse as well as those who have maintained their certification will be strengthened when the investigators have completed planned interviews with a sample of CNAs themselves. This added information should provide some suggestions for effective intervention strategies.

decisions. Unlike other studies that often use very structured questions with a pre-selected set of factors which often constrain the responses, the investigators began by simply asking the CNAs to talk about their work. Subsequent interviews not only focused on the usual factors in these studies (e.g., staffing policies, pay, training, etc...) but what these policies and practices represented to the CNAs:

> "... that CNAs were not appreciated or valued by the organization. It was CNAs' interpretation of this underlying message, and the gulf they saw between organizational rhetoric and organizational policy, rather than the policies themselves, that CNAs identified as the reasons they left their jobs."

Although the CNAs responses were complex and too highly nuanced to present fully here, the management rotation of staff and compensation policy provides a few illustrative examples. From the perspective of management, rotating staff is one way to deal with inadequate staffing by pulling staff from fully staffed units to make up for shortages in other units. From the perspective of the CNAs, managers taking "an aide away from her usual residents, . . . were discounting how much her skill, experience, and especially, her knowledge of these residents contributed to the quality of their care." Similarly, from the management's perspective, an across the board pay raise for all aides is viewed as narrowing the gap between the low pay and a living wage, thereby improving their ability to recruit and retain workers. From the CNAs perspective:

> "When facilities had no, or only minimal, differences in wages for new workers and more experienced workers, or skillful workers and less skilled workers, or those who were doing the work with great commitment and those who were just showing up, CNAs viewed the compensation policy as unfair and indiscriminant, citing it as one more examples of dismissing. A similar message was sent when regular CNAs learned that pool staff, whom they perceived as lacking both commitment and the skill born of familiarity with residents, were paid a higher hourly rate than regular staff."

The central message that emerges from this study, in contrast to the accumulation of (often inconsistent) factors in the typical turnover studies described above, is that CNAs do not respond passively to factors, but actively interpret their meaning in terms of the respect accorded to them both personally and professionally. This has important implications for what kinds of intervention strategies for reducing turnover are likely to be ineffective, as will be discussed below. At the very least, it cannot be assumed that state policies initiatives to reduce turnover, e.g., Medicaid wage-pass-throughs or encouragement of nurse aide career ladders, will automatically have the intended effect.

4.2.5 The Impact of Turnover on Nursing Home Quality

It is usually assumed that high turnover negatively impacts the care received by nursing home residents. Yet, as might be inferred from the above discussion of the lack of good data sources of turnover, the supporting evidence is weak. Indeed, the majority of turnover

studies have been on the factors contributing to turnover; the impact of turnover on quality is assumed. There are two studies cited by the Institute of Medicine (1996) as indicating that High RN and LPN turnover is associated with lower quality of care. These two studies were published 10-11 years ago, based on data collected 16 years ago (two other cited studies were even more dated). One study (Spector and Takada, 1991), limited to nursing homes in a small state, Rhode Island, found that lower RN turnover positively impacted functional improvement. RN turnover did not significantly impact the two other outcome measures (death and functional decline) and LPN and Aide turnover did not impact any of the outcome measures. Further, only 56 of the 80 homes responded to the turnover study. The other IOM cited study (Monroe, 1990) of California facilities in 1986 found that the turnover *of all facility personnel* had a positive impact ($p < .10$) on the outcome quality measure, the number of health related deficiencies. Given that the impact does not even reach the conventional .05 significance level (although the N = 455), that the regression model only explained 8.6 percent of the variance, that nursing turnover was not separately measured, and that the quality outcome measure, deficiencies, is subject to the widely acknowledged inconsistent surveyor behavior,[8] it is hard to find this and the other cited study as providing support for the "turnover impacts quality" hypothesis.

But the absence of direct evidence does not mean that turnover does not impact care and resident outcomes. Given the difficulty in obtaining accurate measures of turnover and the relatively recent interest in turnover, it is not surprising that studies producing compelling evidence on the impact of turnover on quality have not as yet been conducted. Nevertheless, there is a compelling rationale for believing that high turnover negatively impacts quality, a rationale supported by indirect evidence. Researchers have argued that "no one else in the facility approaches their personal knowledge of the residents that the aides have. By virtue of the intimacy of their 'bed and body' work, the aides can observe subtle changes in residents' psychological and physiological conditions before they become clinically significant (Brannon and Smyer, 1994)." The IOM (1996) maintains that " . . . high turnover compromises the continuity of care and supervision of staff . . . high turnover rates adversely affect residents who do not cope well with frequent changes in staff." Others have argued that "at the minimum, turnover affects continuity of care and care recipient relationships . . . staff turnover can often result in staff shortages that require the remaining staff to do too much work in too little time. Turnover breeds more turnover as remaining staff lose morale, feel overworked and undervalued, or even become injured from lifting residents without a helper . . ." (Straker and Atchley, 1999). Turnover also requires orientation of new employees, time for new workers to get "up to speed," and time from existing staff to train new employees (Konrad, 2001).

Absenteeism is a frequently mentioned problem by nurse aides.[9] If one assumes that absenteeism leads to staff shortages (at least in the short run) which leads to higher and more

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8   See Phase 1 Report, chapter 6, for a more detailed discussion of outcome measures and risk adjustment in nurse staffing studies.

9   See Phase 1 Report, chapter 5.

stressful work for remaining staff which in turn leads to turnover and further staff shortages, then there is indirect evidence that this reciprocal process could negatively impact quality. First, there is the compelling evidence presented in Chapter 2 that when staffing ratios fall below certain critical thresholds, there is a substantial increase in quality problems. Second, there is the simulation evidence presented in Chapter 3 that essential care processes that have been demonstrated to result in good quality require a level of nurse aide staffing not obtained by the vast majority of nursing homes. Staffing less than these minimum levels necessarily results in meals that are late, and longer waits for the changing of wet clothing. Third, there is evidence from an observational study of nurse aides on how they managed to survive as a NA when there was simply not enough time to do what the job required (Bowers and Becker, 1992). "Cutting corners" from required care giving tasks was a common strategy of those aides who stayed in contrast to those aides who left:

> "... experienced NAs selected cuts that fell primarily into two categories. First, cuts were selected that could not be traced to any particular NA so that blame could be spread as widely as possible. Shared versus individual accountability was an important organizing dimension of the work. Second, cuts were selected where the work is easily undone and there is no way to know whether it was undone or never done ... it was possible, for example, to significantly reduce the work load by changing frequent 'wetters' at predetermined times rather than immediately after an incontinent episode ..."

To the degree that staff shortages and turnover are reciprocal processes, it is likely that there will be pressures toward "cutting corners" which will in turn have a negative impact on quality. Of course, nursing home administrators have employed a number of strategies to mitigate these problems of staff shortages and turnover. These strategies include: paid overtime, increased workload, canceling days off, increasing scheduled hours, payment of shift differential, and asking for volunteers to work extra (e.g., double shifts). Another common strategy is the use of temporary or agency staff, particularly by facilities with high turnover rates (Straker and Atchley, 1999).

It is difficult to know how effective these management strategies are for mitigating the impact of staff shortages and turnover on resident quality of care. It is often claimed that the use of agency staff reduces the familiarity with the resident and creates morale problems from regular staff, as described above. However, the qualitative care studies of staffing issues conducted for this Phase 2 Report found that the use of agency staff did not negatively impact patient quality (see Chapter 6). Under conditions of being short staffed, it may be better for patient quality to use agency staff then to go short staffed and have regular staff burnout. It is also possible that continuity of care can be maintained under conditions of high turnover if some minimum level of staff retention is also maintained. Although it is mathematically possible for some facilities to have both high retention and turnover, it is unknown whether empirically this actually occurs.

Finally, it should be noted that *some* degree of turnover is not only inevitable, but desirable. Quality might improve if poor performing employees leave and well performing employees are promoted. Without larger samples and better measures of turnover, it is not possible to conduct adequate studies. These studies could definitively examine whether there are critical turnover ratios above which patient quality is seriously compromised. In addition, it would be important to know the relative importance of staffing levels and turnover or staff retention to quality problems. On-going work with the data files constructed for this Phase 2 report will examine this question.

4.3   Quantitative Analyses of Turnover and Retention in Nursing Homes: Overview

While turnover exists in all sectors of the labor force, nursing homes have higher turnover rates than other parts of the service sector, and nurse aides have the highest turnover rate among service sector occupations.[10] In addition to its potential impact on quality of care, turnover has a large impact on facility costs, given that it costs facilities several thousand dollars to hire and train each new employee.

Most previous research on nursing home turnover has been either qualitative or based on data from a small number of facilities or nurses. As a result, little is known about how turnover rates vary across facilities, or how the relationship of turnover to facility characteristics (e.g., ownership type, for-profit status, size), wage and benefit levels, staffing patterns, and county labor market conditions (unemployment rate, per capita income). These issues have not been examined in detail primarily due to a lack of data. Staff turnover data are not routinely collected by the Center for Medicare and Medicaid Studies (CMS), nor are they typically part of state Medicaid Cost Reports or national sample surveys such as the Medical Expenditures Panel Survey and the National Nursing Home Survey.

Following an exhaustive search, we identified three states — California, Kansas, and Wisconsin — for which facility-level turnover data are available. Data for calendar year 1999 were obtained from each of these states and used to address three basic research questions:

- What are mean turnover levels for nursing staff?

- What is the distribution of turnover across facilities?

- How do factors such as wage rates, benefit levels, staffing levels, facility characteristics, and area characteristics affect turnover rates?

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[10]   Sources: Mercer and Mercer, 1998, Salmon et al, 1999.

Turnover rates were high in all three states. In California, the mean turnover percentage for direct nursing employees was 72 percent. The mean turnover percentage for nursing staff (including RNs, LPNs, and nurse aides) was 63 percent in Wisconsin, and 85 percent in Kansas. Turnover among nurse aides was higher than for RNs or LPNs. In California, only 22 percent of nurse aides had continuous service through the entire year and the average turnover percentage was 78 percent. The average turnover rate for nurse aides in Kansas was 100 percent and 76 percent in Wisconsin.

There was considerable variation in turnover levels across facilities. In California, 25 percent of facilities had a turnover percentage among direct nursing employees of 45 percent of less, while 23 percent of facilities had a turnover rate of 100 percent of more. In Kansas, 21 percent of facilities had a turnover percentage among all nursing staff of 50 percent or less, but the turnover percentage for the top quartile of facilities was 110 percent or higher. In Wisconsin, the lowest quartile of facilities had a mean turnover percentage among all nursing staff of 37 percent or less, while 25 percent of facilities had turnover of at least 81 percent.

Differences in wage rates explained only a small portion of the facility level variation in turnover. In California, nurse aide turnover was 83 percent for facilities in the lowest wage quartile (based on wage figures adjusted for cost of living differences), somewhat higher than the 73 percent turnover for facilities in the highest wage quartile. In Kansas, however, average nurse aide turnover was actually slightly higher (107 percent) for facilities in the highest wage quartile than for facilities in the lowest quartile, for which mean turnover was 96 percent.

A series of multivariate regression models were estimated to understand further the relationship between turnover and wage rates, benefit levels, facility characteristics and local labor market conditions. Regression results for California indicated that turnover for both nurse aides and all direct nursing employees was significantly lower for facilities with generous benefits (this was calculated based on the ratio of benefit-to-salary expenditures). Turnover was significantly lower in facilities with 100 or more beds and significantly higher at for-profit facilities. Among nurse aides in California, turnover was lower for higher staffed facilities, facilities that pay higher wage rates, facilities with higher expenditures on benefits, and large facilities. While nurse aide turnover was not related to county unemployment rate, turnover was significantly higher in counties with higher per capita income. In Wisconsin, nursing turnover was significantly lower in facilities with higher staffing levels (based on nursing hours per resident day). Turnover was higher at for-profit facilities and also for facilities associated with a chain. It was lower for facilities in counties with high unemployment rates. Note that no wage or benefit data were available for Wisconsin, so we were unable to analyze how these factors were related to turnover. Among Kansas nursing facilities, neither wage rates nor benefit levels were related to turnover levels.

The variation in turnover rates across facilities suggests that nursing home turnover can be reduced. The regression model results suggest that only a small amount of the differences

across facilities in turnover rates are due to wage and benefit levels, observable facility characteristics, staffing levels, or local labor market conditions. The relatively low statistical power of these models implies that most of the variance in turnover rates is due to the types of facility practices described in the next chapter.

Knowledge about the distribution of turnover and factors that affect it is important for policymakers as they evaluate the desirability and costs of a minimum nurse staffing requirement or programs intended to reduce turnover, such as the wage pass-through programs that a number of states have implemented. It is also important for facilities, as they design and consider the potential impact of programs to attract and retain quality staff.

4.4 Data Sources

We acquired data from three states — California, Kansas, and Wisconsin that require facilities to submit data on nursing staff turnover. These data were also used to identify the high and low turnover facilities for the site visits described in another chapter in this report.

- *California:* Long Term Care Facility Integrated Disclosure and Medi-Cal Cost Reports (Disclosure Report) for calendar year 1999 were acquired from the state's Office of Statewide Planning and Development (OSHPD).

- *Kansas:* Medicaid Cost Report data for 1999 were acquired from the state's Department of Aging. Section J of the Cost Report contains turnover statistics.

- *Wisconsin:* Turnover data were collected as part of the state's 1999 Annual Survey of Nursing Homes, which was conducted by the Wisconsin Division of Health Care Financing, Bureau of Health Information.

Calculating turnover and staff continuity measures

Turnover was calculated by comparing the total number of employees who worked during the year to a measure of the average number of employees at a given point during the year. For each of the three states, we were able to determine total turnover (among RNs, LPNs, and nurse aides), as well as turnover for individual staff categories (the available categories varied by state). Due to the available data, turnover was calculated in a slightly different way for each state.

Some previous studies exclude part-time employees from the turnover calculation, since turnover among these staff result in less impact on facility staffing. It was not possible, however, to measure separately turnover for full and part time staff in any of the three states for which we had data. Also, it was not possible to determine whether turnover was due to voluntary or involuntary separations.

California. The California data include annual turnover percentage and the number of staff with continuous service throughout the one-year reporting period. Figures are reported for nurse aide, and for all direct care staff, a category that includes all employees who provide direct nursing care (e.g., RNs, LPNs, nurse aides, technicians, specialists.). No separate turnover figures are available for RNs or LPNs. Also it is not possible to distinguish full and part time employees. Turnover percentage is calculated by each facility, using this definition:

$$100 * \text{(total number of employees during the period)} / \text{(average number of employees)} - 100$$

We calculated a staff continuity measure based on the number of staff with continuous service divided by the average number of employees during the cost report period.

Kansas. Information on the average number of employees during the period is not available. There is, however, information on the number of employees at the beginning and end of the Cost Report period, allowing an estimate of the average number of employees. Turnover was calculated as:

$$100 * \text{(total number of employees during the period)} / 0.5 * \text{(number of employees at beginning of period} + \text{number of employees at end of period)} - 100$$

The Kansas data allow turnover to be calculated separately for RNs, LPNs, and nurse aides. A measure of overall turnover was calculated as the weighted average of turnover for each staff, weighted by each staff type's contribution to total nurse staffing. While Section J of the Kansas Cost Report form asks for separate information on full and part-time information, we were advised by the Department of Aging that the data on full and part-time employees was not reliable and should not be used.

Wisconsin. The Wisconsin data include employment figures only for the end of the period, and the definition of turnover percentage had to modified slightly:

$$100 * \text{(employees at end of period} + \text{employees hired during period)} / \text{(employees at end of period)} - 100$$

The Wisconsin data do not allow turnover rates to be calculated separately for full and part time employees.

Calculating Wage Rates and Fringe Benefits

For Kansas and California, it was possible to calculate average hourly wage rates for RNs, LPNs, and nurse aides, based on total salary and wages paid to each staff type and hours worked or paid. The California data report total hours actually worked, not hours paid, while the Kansas data report total hours paid. As a result, the hourly wage rate figures for the two states are not directly comparable. No wage information is reported in the Wisconsin data.

Both California and Kansas report total expenditures for fringe benefits across the entire facility, but do not have a breakdown of the amount of benefit costs that are allocated to nursing staff. The benefit rate for Kansas was defined as the percentage of total facility costs (from Schedule A of the Cost Report) related to benefits. For California, benefit percentage was defined as the ratio of fringe benefit to payroll costs. The differences in definition were related to the data available for calculating benefits.

Adjusted wage rates

Part of the difference in wage rates across facilities reflects differences in the cost of living. We created an adjusted wage rate using CMS's urban and rural wage indexes. The wage index is designed to reflect local differences in wage levels. It is determined by computing the hourly wage rate for a metropolitan statistical area or non-urban area by the national hourly wage rate. These wage rates are based on hospital wage index data for fiscal year 2000.

Exclusions

For all three states, turnover statistics are based on unaudited, self-reported data from providers. The data are only as reliable as the reports submitted by providers. We developed a set of decision rules to exclude facilities that appeared to have unreliable turnover data. Because we only had data from one year, we could not examine the longitudinal changes in turnover, but excluded facilities that had internal inconsistencies in the data used to calculate turnover or extreme outlier values that suggested data errors.

- **California:** There was one facility that reported a negative turnover percentage for the year—it was excluded, as were facilities that had apparent inconsistencies in their reported staffing levels and/or hours worked. This includes facilities that had an average hourly wage rate for nurse aides or direct nursing employees of less than $4.75 per hour, or a wage rate of more than $20 per hour for nurse aides or $40 per hour for direct nursing employees. These exclusions affected 79 of the 1,238 facilities in the California data.

- **Kansas:** Thirty-five of the 362 facilities in the state reported no turnover for RNs, LPNs or nurse aide for all of 1999. While it is possible that some of these facilities actually did not have any turnover, it is much more likely that these facilities simply failed to complete accurately the turnover section of the Cost Report. These facilities were excluded from our analyses, as were facilities for which there were inconsistencies in reported staffing information. Facilities for which the difference in the number of employees at the beginning and end of the period did not equal the net of new employees hired during the period and employees terminated during the period. These exclusions affected 121 (28.5 percent) of facilities in the state. This large number of facilities with apparent data problems raises concerns about the reliability of the Kansas data.

- **Wisconsin:** There were three facilities that reported no turnover for all of 1999 — these facilities were excluded, as were two other facilities that reported no nurse aide turnover for the year. It is not possible to know with certainty whether turnover statistics from these facilities are reliable, but these facilities had other data irregularities that made their turnover data appear unreliable. For example, none of these facilities reported employing any nurse aides (either full or part time) for the two-week period that the state collects staffing data as part of its Annual Survey of Nursing Homes.

Other Data Sources

Several other data sources were used to create variables that were used as independent variables in the regression models.

- **OSCAR:** The Center for Medicare and Medicaid Services Online Survey Certification and Reporting System (OSCAR) database contains information on every nursing home in the United States that is certified by Medicare and/or Medicaid. The data are collected by the state survey and certification agencies at the time of the facility's survey (performed at least every 15 months). We used OSCAR to measure facility characteristics and staffing levels for Wisconsin nursing homes (the Cost Report data were used to measure these items for California and Kansas).

- **Area Resources File.** The 2000 Area Resource File (ARF, http://www.arfsys.com/) contains more than 7,000 variables for each of the nation's counties. ARF contains information on health facilities, health professions, measures of resource scarcity, health status, economic activity, health training programs, and socioeconomic and environmental characteristics. In addition, the file contains geographic codes and descriptors which enable it to be linked to many other files and to aggregate counties into various geographic groupings. It was used to measure county labor market conditions (unemployment rate, per capita income), as well as to create an indicator of county urban-rural status.

4.5   Hypotheses

Most previous research on nursing home turnover have been either qualitative (Atchley, 1996, Barry, 1996, Brannon and Smyer (1990), Caywood, 1998, McDonald C, 1992, McDonald and Muller, 1998), or based on data from a small number of facilities or nurses (American Health Care Association, 1998, Banaszak-Holl and Hines, 1996, Bell 1998, Broughton and Golden, 1995, Caudill and Patrick, 1989, 1992, Close et. al, 1994, Helmer et. al, 1993, Remsburg, et. al, 1999). A number of factors believed to influence turnover have been identified in these previous studies:

- **Wage and benefit levels.** The low wage and benefit levels for nurse aides have been noted in many previous studies as a reason for high turnover among these staff.

Susan Eaton (see the next chapter) found that the primary reasons given for nurse staff turnover were benefits and staffing levels, and that wages "also meant something" to nursing home workers. Bell, Brouthon and Golden, and Caudill and Patrick all identified higher wage rates as being associated with lower turnover among nurse aides. Close found that RN turnover increased with lower wage rates. Most studies, however, make clear that wage and benefit levels are but one factor that is related to turnover. The data available for California and Kansas permit us to measure how turnover rates vary based on the wage rates paid to nursing staff and facility benefit levels.

- *Facility staffing levels* Both qualitative and quantitative studies have found that low staffing levels are related to turnover. Eaton identified a sufficient staffing ratio as a key management practice related to low turnover. In a survey of Iowa nurse aides, Bell found that short staffing and wage/benefits were the main reasons that respondents were considering leaving their current job.

- *Facility characteristics.* Barry found that RN, LPN, and nurse aide turnover rates were lower for non-profit facilities, facilities with 100 or more beds, and facilities that were not associated with a nursing home chain. Banaszak-Holl and Hines also found that turnover was related to for-profit status. Broughton and Golden hypothesized that non-profit facilities may retain staff longer because they have higher occupancy rates, more private pay residents, and tend to be led by administrators with longer job tenure, suggesting more organizational stability.

- *County characteristics.* In a survey of 254 nursing home administrators and Directors of Nursing, Banaszak-Holl found that turnover was lower in counties with higher per capita income and higher in counties with more nursing home beds. While previous studies have not examined the relationship between unemployment rate and turnover, economic theory predicts that turnover should be higher in areas with low unemployment and greater job opportunities.

There are some factors that have been identified as important predictors of turnover that we are not able to measure with our data. A number of studies, including Brannon and Smyer and McDonald have identified lack of training and career advancement paths as one reason for high turnover among nurse aides. C. McDonald found that career ladders can make employees feel valued and recognized, reducing turnover. The data available for this study did not include any information on the amount of training or the career paths available to nursing staff. Susan Eaton (see the next chapter) identified leadership and management, a culture of valuing and respecting caregivers, and organization practices as important factors that differentiate low and high turnover facilities. Banaszak-Holl and Hines found that the turnover rate in facilities in which nursing staff accepted the advice of nurse aides or simply discussed care plans with aides was 50 percent lower than in facilities without this practice.

4.6　Results

4.6.1　Average Turnover and Staff Continuity

Turnover rates were high in all three states, particularly for nurse aides. In two of the three states, however, turnover levels were lower than those found by the American Health Association, based on a survey of turnover in a sample of for-profit, chain affiliated facilites (AHCA, 1998). Turnover was considerably higher in Kansas than for either Wisconsin or California. Wage rates were higher in Wisconsin and California, but it is not possible to determine whether the across-state differences are due to wage rate differences or to other differences across the states. As expected, turnover was considerably higher for nurse aides than for RNs or LPNs.

Across the entire labor force, the overall turnover rate is estimated to be between 13 and 18 percent and 20 percent for service industries (Mercer, 1998). Average turnover in nursing homes was much higher than for other sectors of the service economy.

- In California, the mean turnover percentage for direct nursing employees was 72 percent (Table 4.1). The mean level for nurse aides was 78 percent. Nearly 35 percent of direct nursing staff were employed at the facility for the entire reporting period, but only 22 percent of nurse aides had continuous service throughout the year.

- Kansas had higher turnover than either California or Wisconsin. In Kansas, average turnover for nurse aides was 100 percent (Table 4.2). Turnover for RNs (55 percent) and LPNs (57 percent) was much lower. Data on staff continuity were not available for Kansas.

- The average turnover percentage for nurse aides in Wisconsin was 76 percent (Table 4.3). Turnover was 41 percent for RNs and 39 percent for LPNs. It was not possible to calculate staff continuity measures for Wisconsin.

4.6.2　Distribution of Turnover and Staff Continuity

In all three states, there was considerable facility level variation in turnover levels. Some facilities were able to keep turnover at low levels, while other facilities, often in the same labor market, experienced much higher turnover rates. A small number of facilities had extremely high turnover rates.

California. In California, median turnover among direct nursing employees was 63 percent, and the standard deviation was 39 percent (Table 4.1). Ten percent of facilities had turnover of 31 percent of less, while ten percent of facilities had turnover of more than 120 percent (Table 4.1, Figure 4.1). One-fourth of the state's nursing facilities had nurse aide turnover of 100 percent or more. Only 25 percent of facilities had nurse aide turnover of 46 percent or less (Table 4.1, Figure 4.2).

Similar variation was observed in the staff continuity measure:

- Among all direct nursing staff, ten percent of facilities reported that at least 61 percent of staff were employed for the entire year. Median staff continuity, however, was only 31 percent, and it was 15 percent or less at 10 percent of facilities (Table 4.1, Figure 4.3).

- As expected, staff stability was lower for nurse aides. Fewer than 25 percent of facilities had 30 percent of more of their nurse aides employed throughout the year, and 25 percent of facilities had staff continuity of 13 percent or less (Table 4.1, Figure 4.4).

Kansas. While turnover levels in the state were high, there were some facilities that were able to keep turnover at relatively low levels. Across all nursing staff, the top quartile of facilities had turnover of 110 percent (Table 4.2, Figure 4.5). Twenty five percent of facilities, however, were able to keep 54 percent of less. Nurse aide turnover in the state was extremely high at some facilities. The top quartile had nurse aide turnover of 132 percent per year, and 10 percent of facilities reported nurse aide turnover of at least 176 percent (Table 4.2, Figure 4.8). Fewer than 25 percent of the state's facilities were able to keep nurse aide turnover below 60 percent. Turnover for RNs and LPNs was considerably less than for nurse aides. One fourth of facilities had RN and LPN turnover of 25 percent of less. More than ten percent of facilities, however, had RN and LPN turnover of 100 percent of more (Figures 4.6 and 4.7).

Wisconsin. Overall turnover for Wisconsin facilities was lower than for California or Kansas, and this was especially true for facilities at the high end of the distribution. Only 25 percent of facilities had nursing staff turnover of more than 81 percent, considerably lower than the top quartile for the other two states (Table 4.3, Figure 4.9). Twenty five percent of the state's facilities reported overall turnover of 37 percent or less. The distribution of nurse aide turnover was quite similar for California and Wisconsin, although levels were slightly lower in Wisconsin. Fewer than 25 percent of Wisconsin's facilities reported nurse aide turnover of 100 percent of more, while 10 percent had turnover of 26 percent or less (Figure 4.12). Consistent with Kansas, turnover for RNs and LPNs was much lower than turnover for nurse aides. A small number of facilities reported almost no RN or LPN turnover, while more than 25 percent of facilities had RN turnover of more than 50 percent (Figures 4.10 and 4.11).

Table 4.1
Turnover and Continuity Statistics: California, 1999

	Mean	Std. Dev.	Percentile				
			10	25	50	75	90
Employee turnover percentage							
Direct nursing employees	72.3%	38.6%	31%	45%	65%	93%	123%
Nurse aide	77.8%	45.8%	31%	46%	67%	100%	136%
Percentage of employees with continuous service throughout the year							
Direct nursing employees	34.8%	18.3%	15%	21%	31%	45%	61%
Nurse aide	22.4%	12.4%	9%	13%	20%	29%	39%

Notes: N= 1,167.

Sources: State of California, Office of Statewide Health Planning and Development , Long-Term Care Facility Annual Financial Data, 1999

Table 4.2
Turnover Statistics: Kansas, 1999

	Mean	Std. Dev.	Percentile				
			10	25	50	75	90
Total nursing staff	84.8%	42.3%	33%	54%	78%	110%	145%
RN	54.7%	43.1%	9%	24%	45%	75%	118%
LPN	57.2%	47.0%	9%	25%	45%	78%	120%
Nurse aide	100.1%	54.3%	35%	61%	92%	132%	176%

Notes: N= 454.

Sources: Kansas Department of Aging, Medicaid Cost Report Data, 1999

Table 4.3
Turnover Statistics: Wisconsin, 1999

	Mean	Std. Dev.	Percentile				
			10	25	50	75	90
Total nursing staff	63.3%	38.1%	24%	37%	57%	81%	112%
RN	41.2%	43.0%	7%	17%	32%	54%	80%
LPN	38.7%	40.5%	0%	13%	27%	50%	88%
Nurse aide	76.2%	47.7%	26%	43%	67%	97%	142%

Notes: N= 454

Sources: Wisconsin Division of Health Care Financing, Bureau of Health Information, Annual Survey of Nursing Home, 1999

Figure 4.1: Distribution of Direct Nursing Care Staff Turnover: California
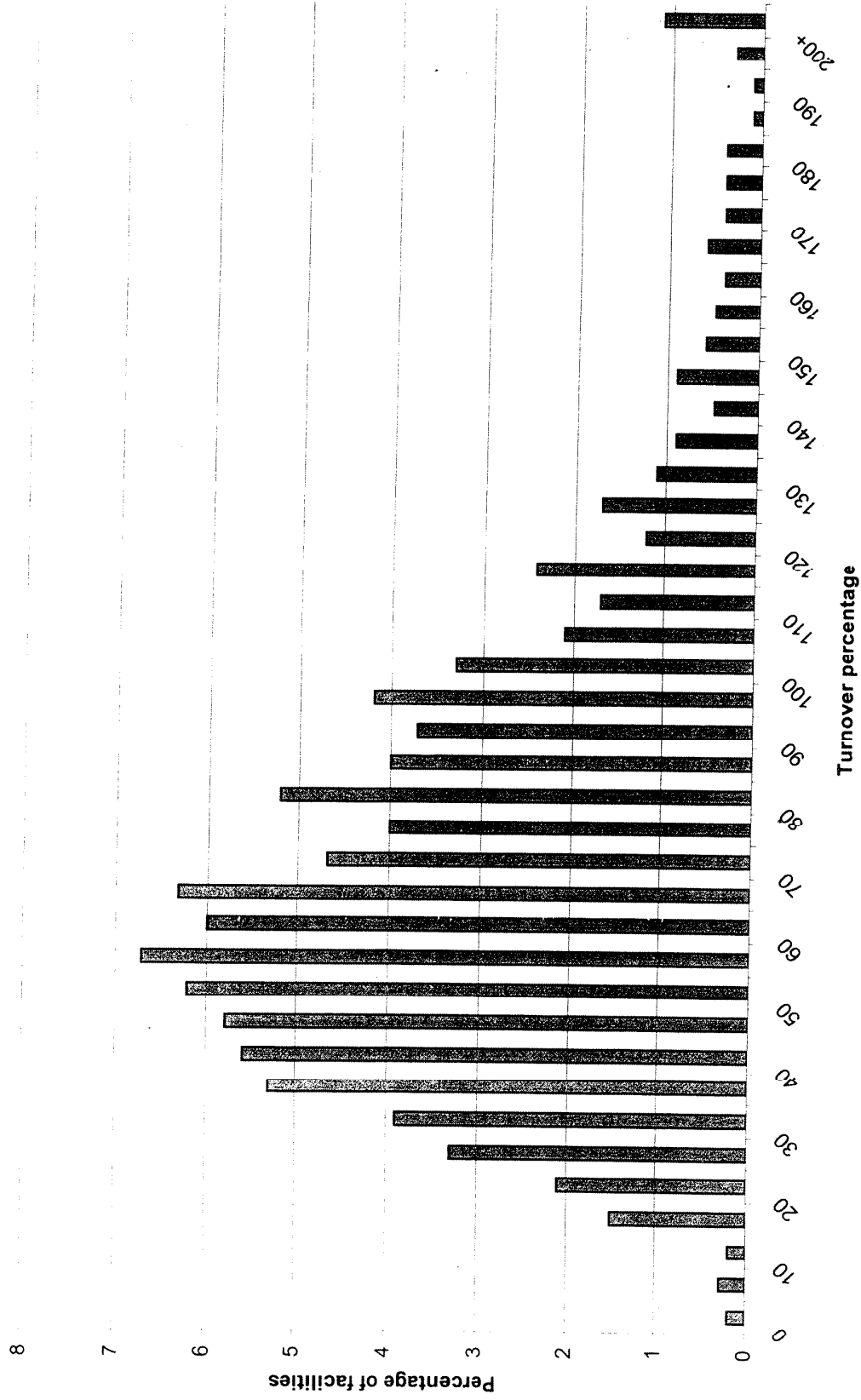
Figure 4.2: Distribution of Nurses Aide Turnover: California

Turnover percentage

Percentage of facilities
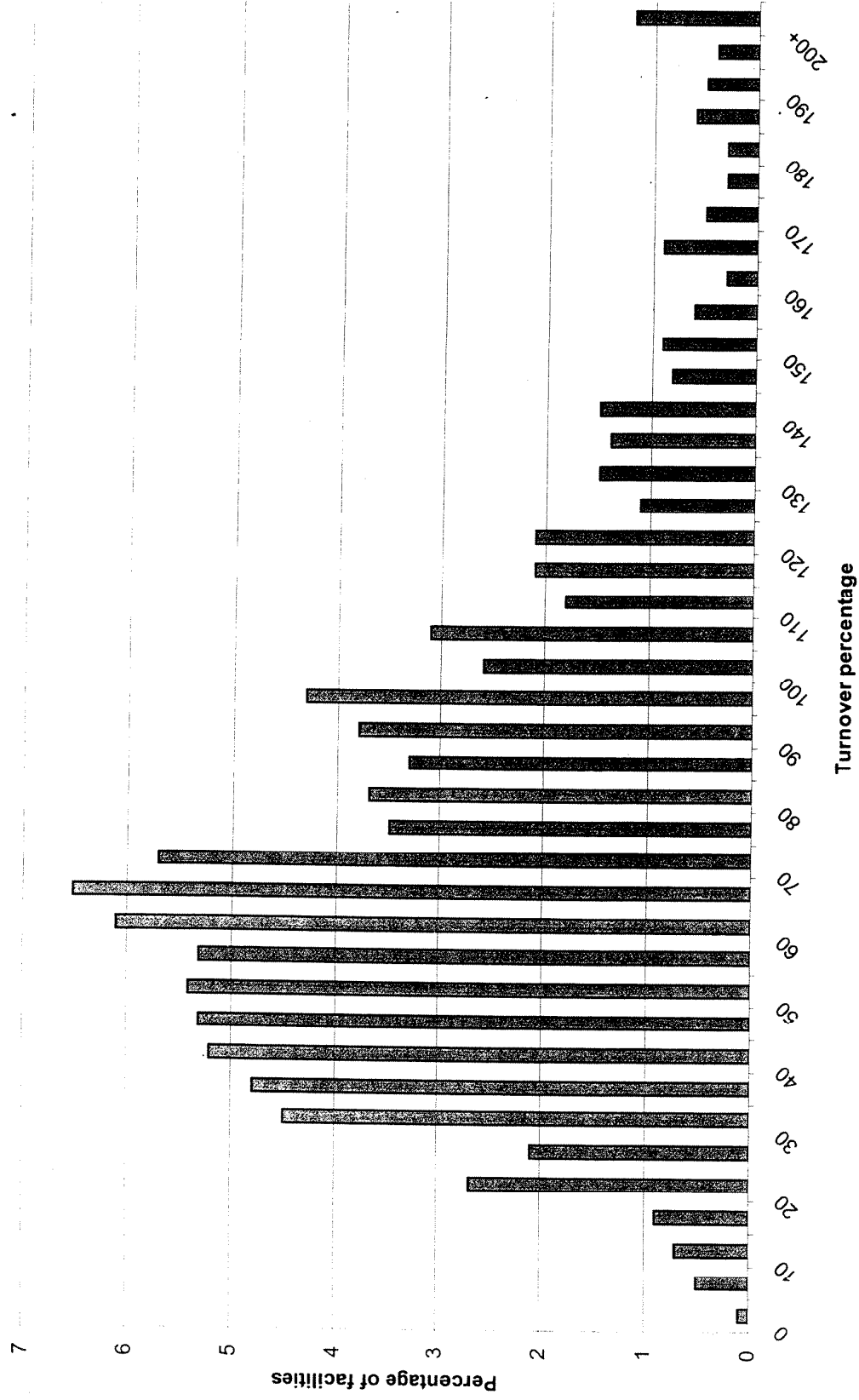
Figure 4.3: Distribution of Direct Nursing Care Staff Retention: California

Percentage of facilities (y-axis)

Percentage of Staff with Continuous Service For Entire Year (x-axis)
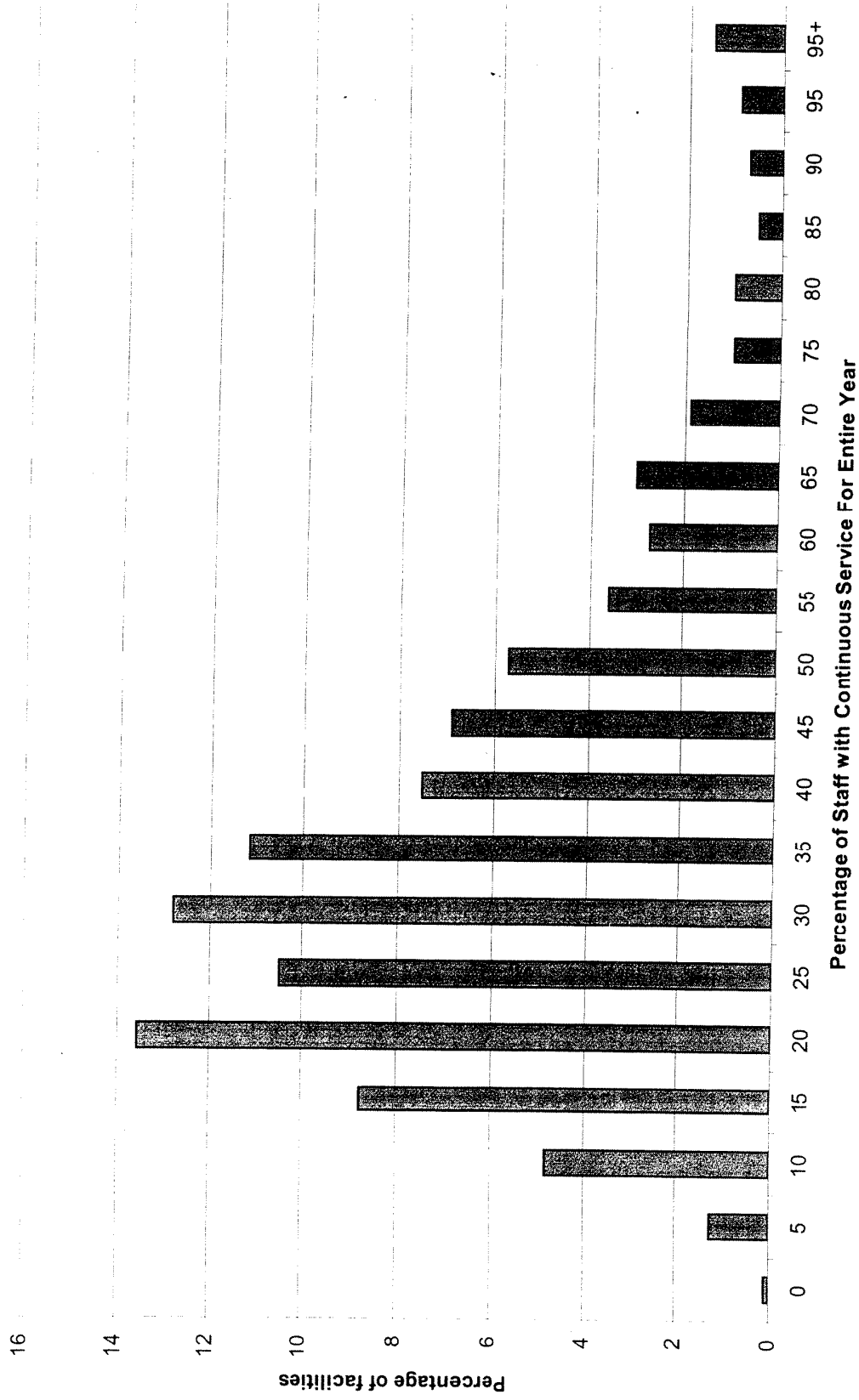
Figure 4.4: Distribution of Nurse Aide Retention: California

Percentage of Staff with Continuous Service For Entire Year

Percentage of facilities
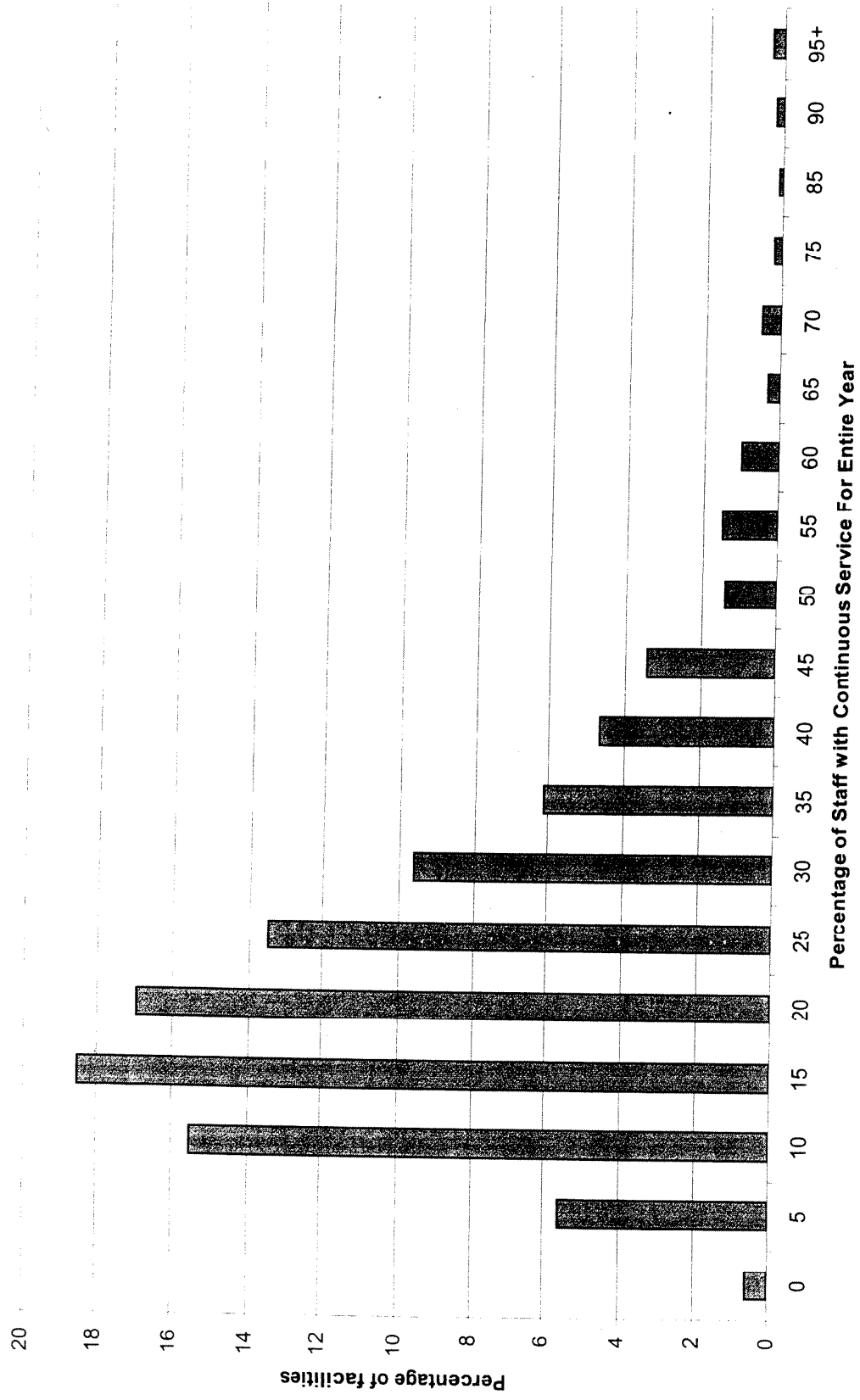
Figure 4.5: Distribution of Total Nursing Turnover: Kansas

Turnover percentage

Percentage of facilities
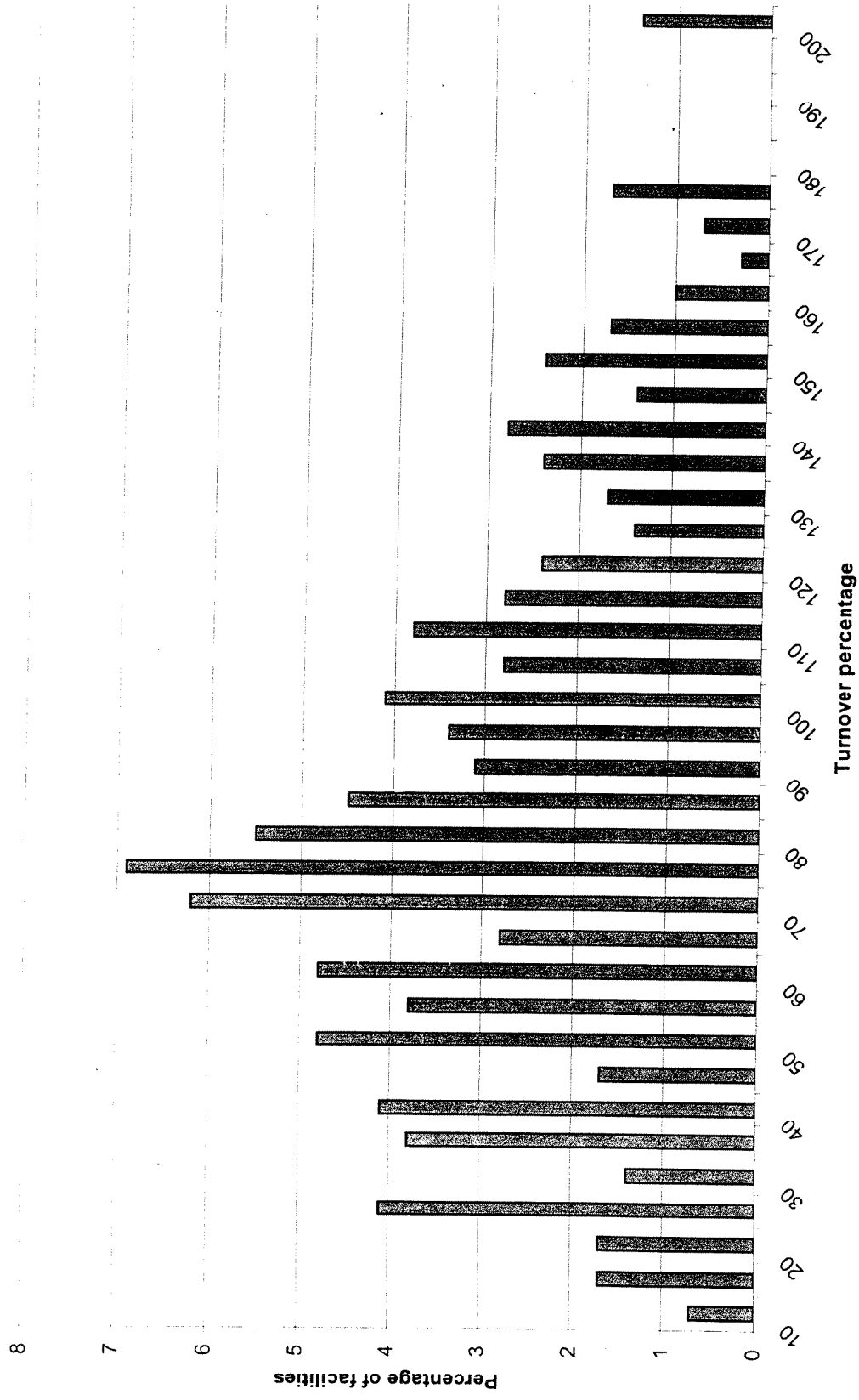
Figure 4.6: Distribution of RN Turnover: Kansas

Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes
Phase II Final Report, December 2001
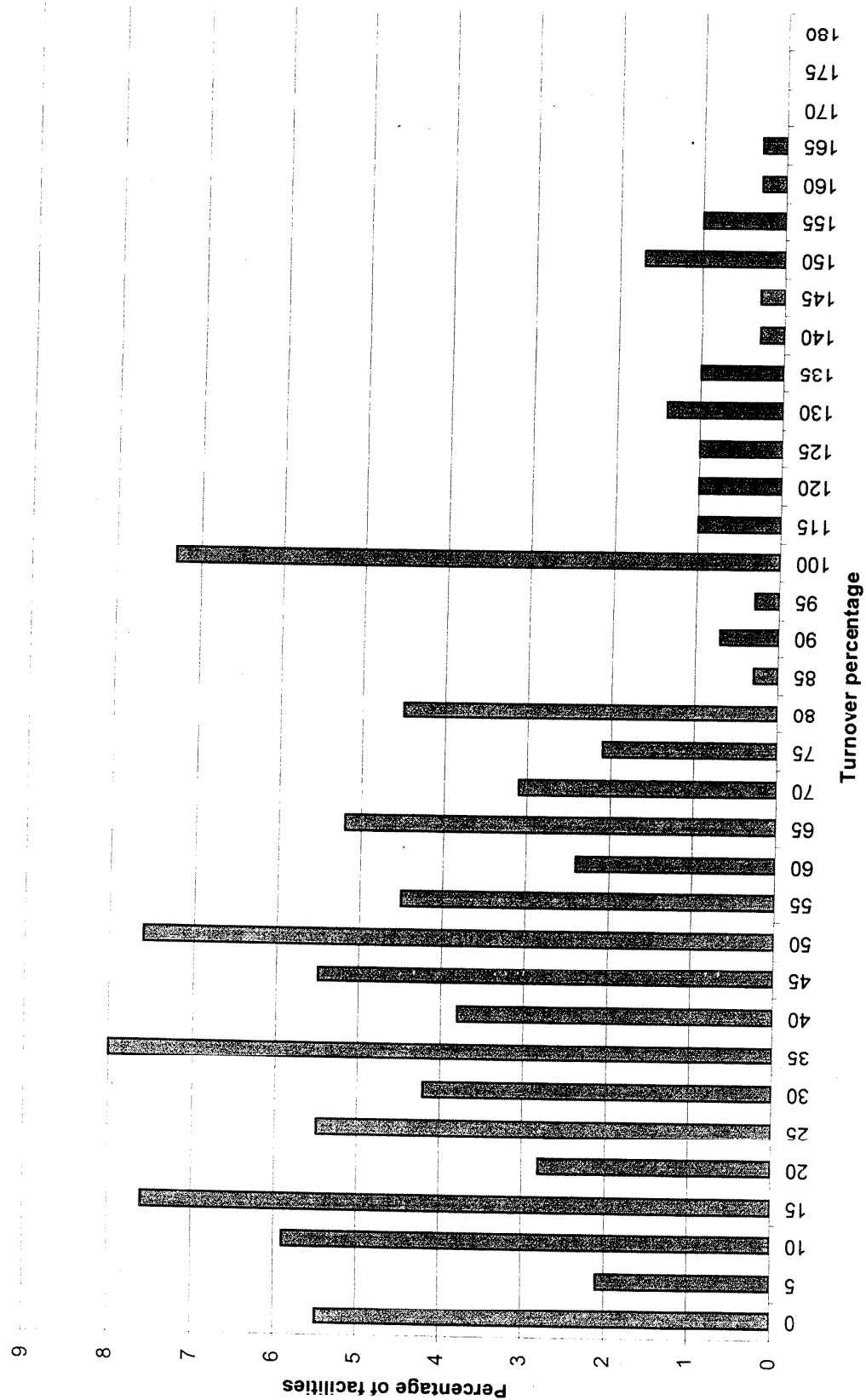
Figure 4.7: Distribution of LPN Turnover: Kansas

Percentage of facilities (vertical axis, 0–10)

Turnover percentage (horizontal axis: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200+)

Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes
Phase II Final Report, December 2001
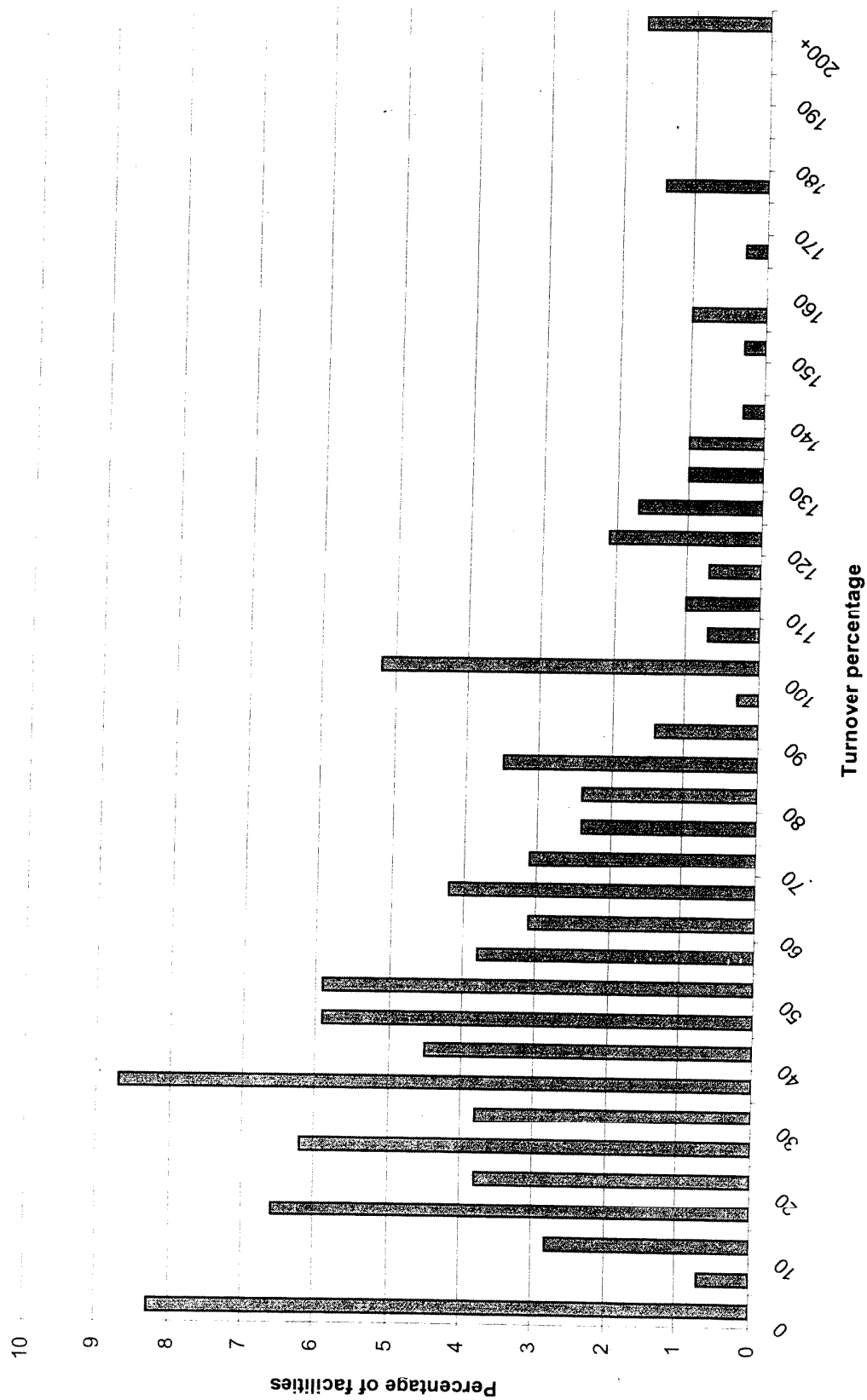
Figure 4.8: Distribution of Nurse Aide Turnover: Kansas

Turnover percentage

Percentage of facilities

Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes
Phase II Final Report, December 2001
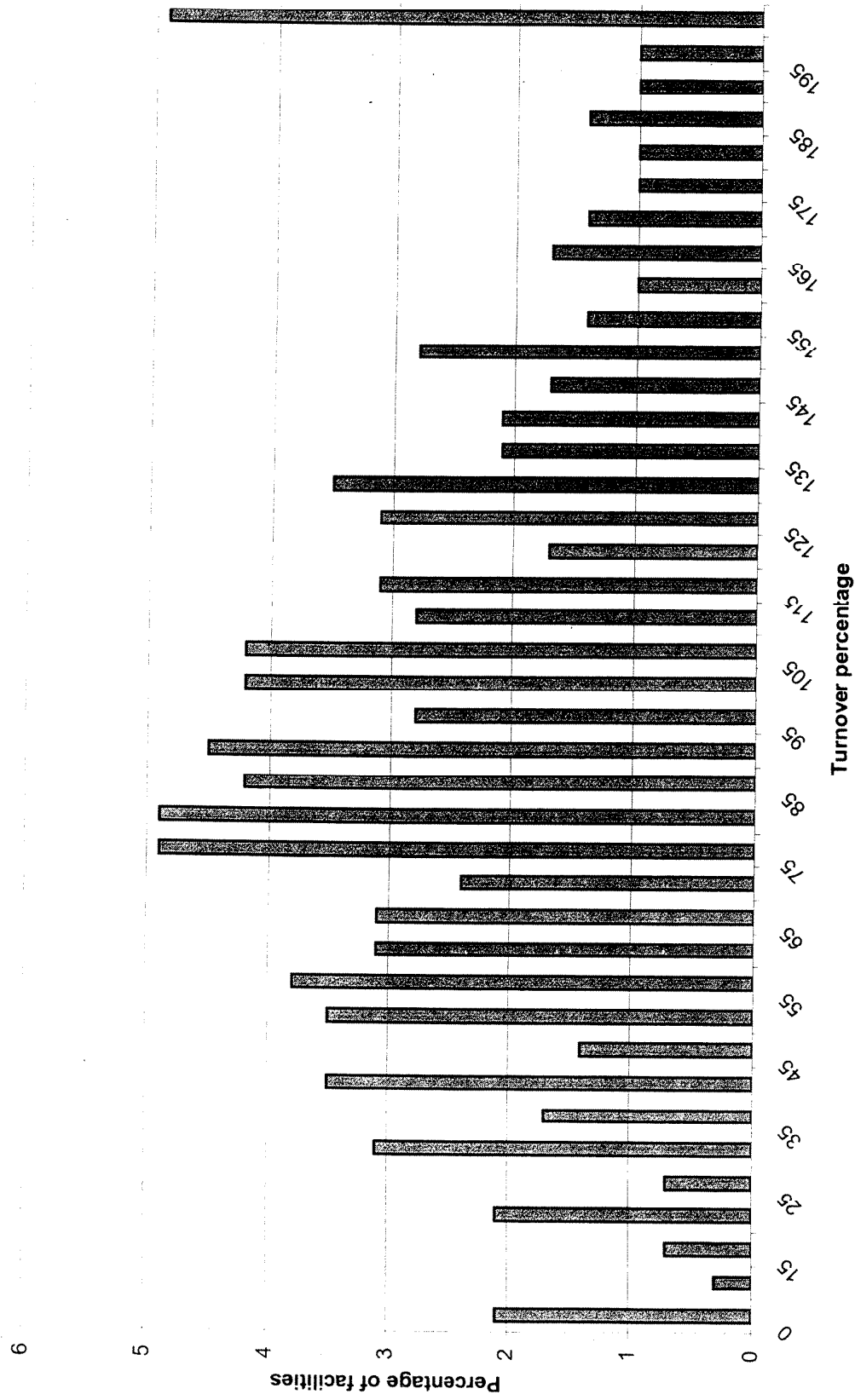
Figure 4.9: Distribution of Total Nursing Turnover: Wisconsin

Percentage of facilities (vertical axis)

Turnover percentage (horizontal axis)

Figure 4.10: Distribution of RN Turnover: Wisconsin

Figure 4.10: Distribution of RN Turnover: Wisconsin

Percentage of facilities

Turnover percentage
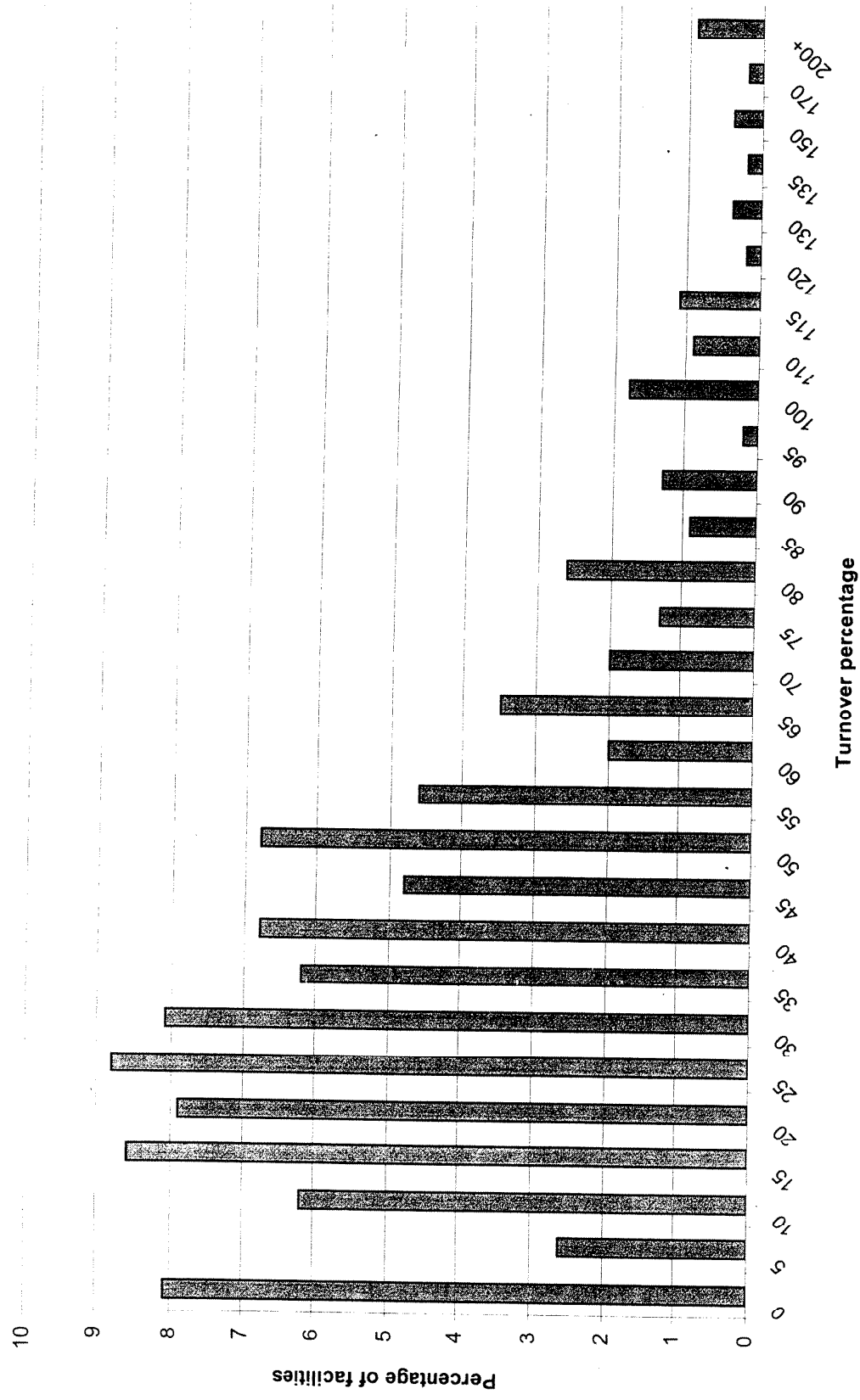
Figure 4.11: Distribution of LPN Turnover: Wisconsin

Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes
Phase II Final Report, December 2001

Figure 4.12: Distribution of Nurse Aide Turnover: Wisconsin

4.6.3 Distribution of Wage and Benefit Levels

Low wage and benefit levels are widely cited as an important cause of nursing home turnover, especially for nurse aides. A major goal of this research is to measure the relationship between wage rates and turnover levels. Wage rate data were available for California and Kansas, but not Wisconsin. A first step in this analysis was to examine the distribution of the wage rates paid to RNs, LPNs, and nurse aides across facilities. In order for turnover to be relate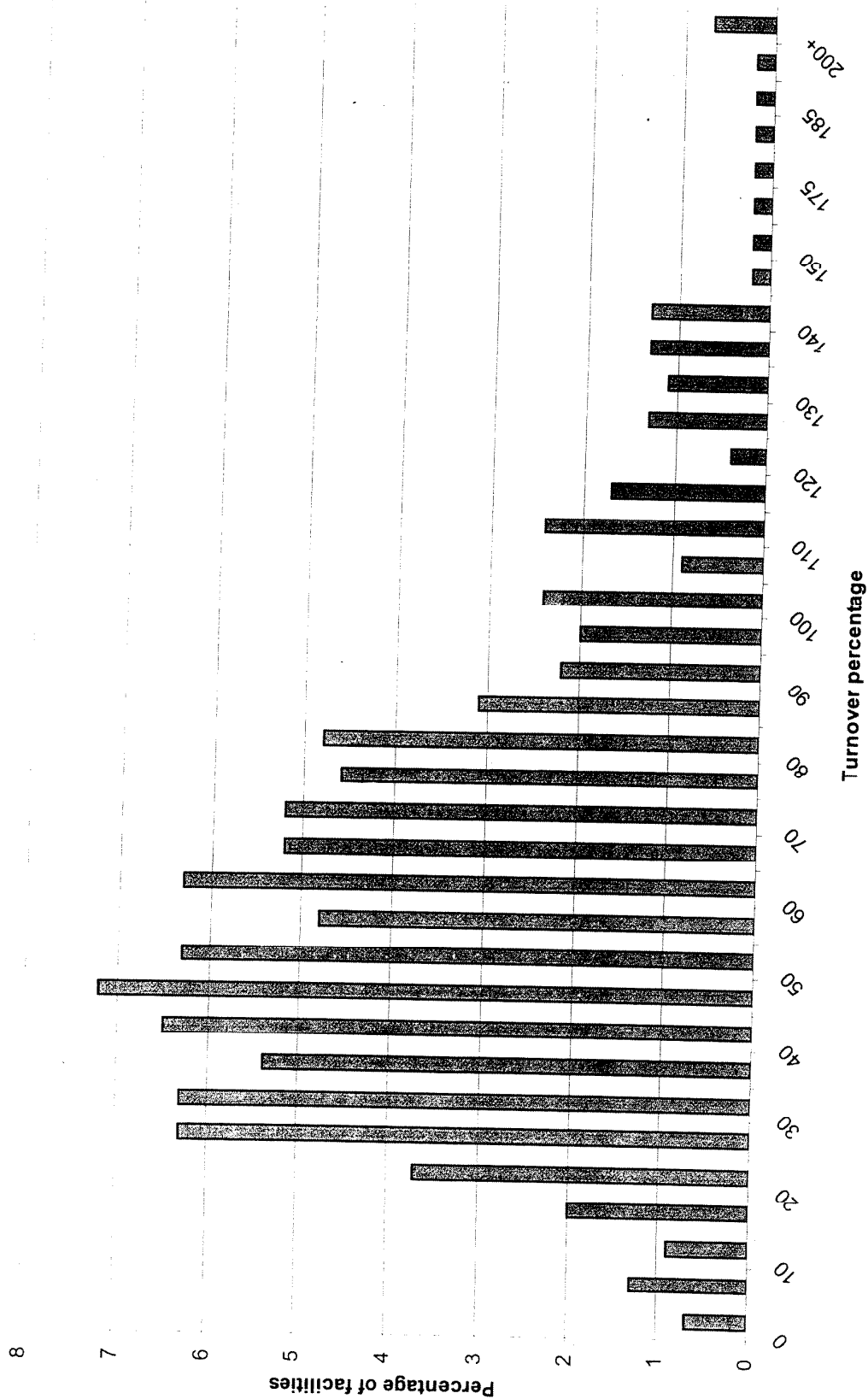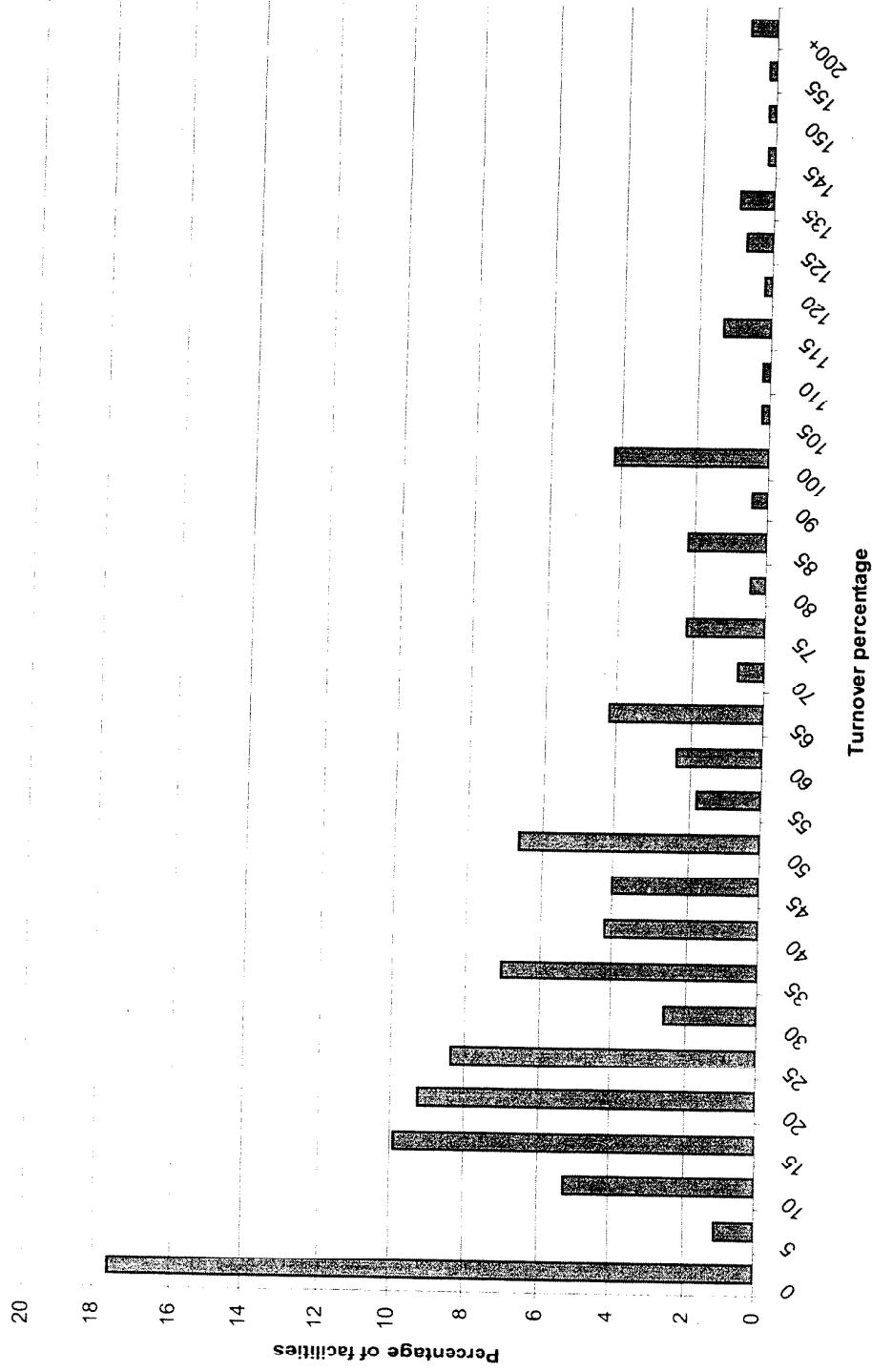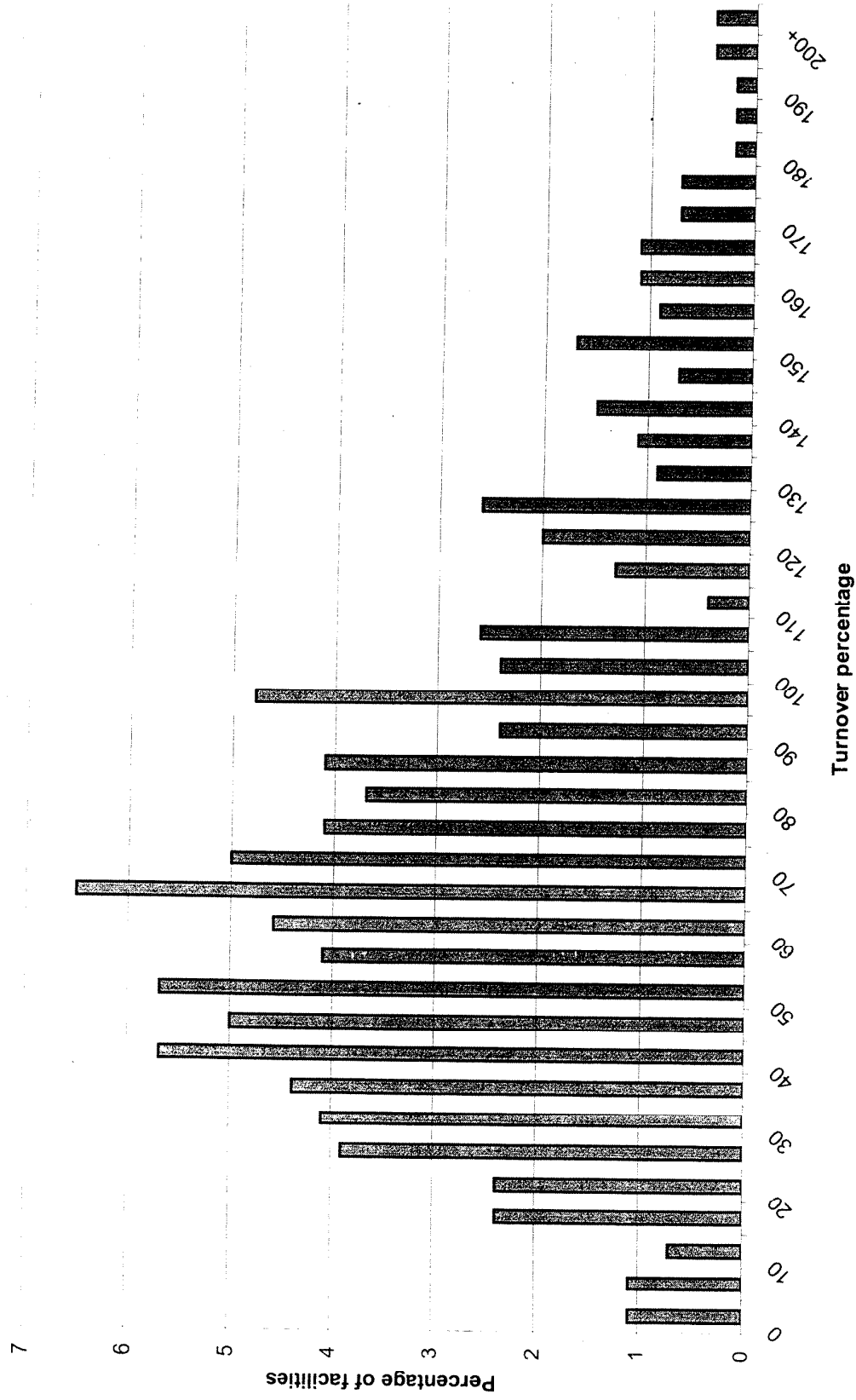d to wage rates, there must be variation across facilities in the wage rates paid to nursing staff. (Note that the wage figures discussed in this section are actual wage rates and are not adjusted for differences in the area wage index. Adjusted wage rates are used in the regression models described in Section 4.6.5).

- The average wage for RNs in California was $20.58 per hour, and the standard deviation was $2.79. Twenty-five percent of facilities paid their RNs $22.33 or more per hour, while the lowest quartile paid RNs $18.75 per hour or less (Table 4.4).

- The average wage rate for RNs in Kansas was considerably lower ($17.35 per hour) (Table 4.5), although the distribution was similar. In Kansas, 25 percent of facilities paid RNs at least $19.04 per hour, while 25 percent paid RNs $15.40 per hour or less.

- In California, the average wage rate for LPNs was $15.79 per higher (Table 4.4), compared to $12.83 per hour in Kansas (Table 4.5). There was somewhat more variance in LPN wage rates in California — the standard deviation was $2.07 in California, compared to $1.78 per hour in Kansas. In California, 80 percent of facilities had an LPN wage rate between $13.46 and $18.42 per hour (Table 4.4). Ten percent of Kansas facilities paid LPNs $10.72 per hour or less, while the top ten percent of facilities have an LPN wage rate of $15.23 or more (Table 4.5).

- At half of the state's nursing homes, California nurse aides had hourly wage rates between $7.22 and $8.95 per hour. Ten percent of facilities paid their nurse aides $10.00 per hour or more (note that we are not able to determine whether the extent to which this is due to higher base wage rates or greater use of overtime at these facilities) (Table 4.4). Ten percent of facilities in the state paid nurse aides $6.81 per hour or less, not much above the minimum wage.

- While the average nurse aide wage rate in Kansas was slightly lower ($8.04 per hour, versus $8.19 per hour in California), the distribution was similar. Fifty percent of facilities in Kansas paid nurse aides between $7.25 and $8.73 per hour. Ten percent of facilities paid nurse aides $9.69 per hour or more, while the lowest 10 percent of facilities paid their nurse aides $6.76 per hour or less.

We also examined the facility-level variation in facility benefit costs. While the different method used to calculate benefit costs in California and Kansas make it impossible to compare benefit levels between the two states, there was considerable variation in benefit

levels across facilities. In Kansas, on average, benefit expenditures represented about 6 percent of total facility expenditures. Fifty percent of facilities had benefit expenditures between 4.7 and 6.8 percent, while 10 percent of facilities devoted 8.1 percent or more of total expenditures to benefits.

Table 4.4
Wage Rates and Fringe Benefit Percentage: California, 1999

			Percentile				
	Mean	Std. Dev.	10	25	50	75	90
RN	$20.58	$2.79	$17.36	$18.75	$20.53	$22.33	$24.64
LPN	$15.79	$2.07	$13.46	$14.37	$15.54	$17.08	$18.42
Nurse aide	$8.19	$1.39	$6.81	$7.22	$7.88	$8.95	$10.00
Benefit percentage	25.80	6.20	18.70	21.20	25.10	29.10	34.30

Notes: N= 1,167

Benefit percentage applies to all nursing home staff and is calculated as the total expenditures on benefits divided by total facility payroll expenses.

Sources: State of California, Office of Statewide Health Planning and Development , Long-Term Care Facility Annual Financial Data, 1999

Table 4.5
Wage Rates and Fringe Benefit Percentage: Kansas, 1999

			Percentile				
	Mean	Std. Dev.	10	25	50	75	90
RN	$17.35	$2.99	$14.56	$15.40	$17.11	$19.04	$20.75
LPN	$12.83	$1.78	$10.72	$11.70	$12.61	$13.86	$15.23
Nurse aide	$8.04	$1.19	$6.76	$7.25	$7.89	$8.73	$9.69
Benefit percentage	5.90	2.10	3.70	4.70	5.60	6.80	8.10

Notes: N= 284

Benefit percentage applies to all nursing home staff and is calculated as the percentage of total facility costs related to benefits

Sources: Kansas Department of Aging, Medicaid Cost Report Data, 1999

4.6.4   Relationship Between Turnover and Wage and Benefit Levels: Descriptive analysis

We examined turnover and staff stability measures stratified by facility wage and benefit quartiles. These analyses suggested that, while turnover was somewhat lower in higher paying facilities, benefits seemed to have a stronger relationship with turnover.

Wage Rates

- In California, turnover among all direct nursing staff was somewhat lower at higher paying facilities, although the relationship was small. Turnover was 73 percent at

facilities in the lowest wage quartile (based on the average hourly wage rate paid to RNs, LPNs, and nurse aides, weighted by the share of each category in total nursing hours at the facility), 76 percent for facilities in the second quartile, 71 percent for the third quartile, and 70 percent for facilities in the top quartile (Table 4.6).

- There was a somewhat stronger relationship between nurse aide turnover and wage rates. Nurse aide turnover was 84 percent for facilities in the lowest (nurse aide) wage quartile, 79 percent for the second quartile, 74 percent for the third quartile, and 73 percent for facilities in the top quartile. The $1,73 per hour wage difference between the first and fourth quartiles (from Table 4.5) was thus associated with an 11 percent reduction in turnover.

- Similarly, staff continuity was somewhat higher at facilities with more generous wage rates. The percentage of direct nursing staff with continuous service throughout the year was 31 percent for facilities in the lowest wage rate quartile, compared to 38 percent for facilities in the third wage rate quartile and 37 percent for facilities in the highest quartile.

- The percentage of nurse aides with continuous service was slightly higher at facilities with higher wage rates. Only 19 percent of nurse aides at facilities in the lowest wage quartile stayed at their jobs for the entire year, compared to 25 percent for the third highest quartile and 23 percent for facilities in the highest wage rate quartile.

In Kansas, turnover rates were actually somewhat higher at higher paying facilities.

- RN turnover in the state was 55 percent for facilities in the lowest wage rate quartile, somewhat lower for facilities in the middle two quartiles, and 64 percent for facilities in the highest quartile (Table 4.7).

- A similar pattern was observed for LPNs. Turnover ranged from 55 percent for facilities in the lowest wage rate quartile to 60 percent for facilities in the third quartile, and 63 percent for facilities in the highest quartile.

- For nurse aides, turnover was 96 percent for facilities in the lowest quartile, 106 percent for the second quartile, 85 percent for the third quartile, and 107 percent for facilities in the highest quartile. This inconsistent pattern suggests that differences in wage rates are not a major driver of the differences in turnover described above.

Benefit Levels

The relationship between benefit levels and turnover was strong for both California and Kansas. This suggests that a benefit increases may be more effective than wage rate increases in reducing turnover, particularly for facilities with relatively low benefit levels. The available data do not permit us to identify the types of benefits offered by facilities (e.g.,

vacation, sick time, health insurance, other), or even how the benefits at the facility are distributed across different employee categories (e.g., the proportion of benefit expenditures related to nurse aides). Our results, however, do suggest that there is a strong relationship between benefit levels and turnover.

- In California, turnover among direct nursing employees was 84 percent for facilities in the lowest benefit quartile, 73 percent for the second quartile, 71 percent for the third quartile, and only 63 percent for facilities in the top quartile in terms of benefit levels (Table 4.8). From Table 4.5, the benefit percentage (defined as the ratio of benefit to payroll expenditures) was 21 percent or less for the first quartile and 29 percent or more for the highest quartile.

- Among nurse aides, average turnover was 89 percent for facilities in the lowest benefit quartile, but consistently lower for facilities with higher benefit levels. Nurse aide turnover was 67 percent for facilities in the highest benefit quartile.

- Staff continuity was considerably higher at facilities with more generous benefits. Only 31 percent of direct nursing staff at facilities in the lowest quartile were employed during the entire year, compared to 36 percent at facilities in the third quartile and 38 percent at facilities in the highest quartile.

- Among nurse aides, 19 percent who worked at facilities in the lowest quartile were employed for the entire year, compared to 22 percent for the second quartile, 23 percent for the third quartile, and 25 percent for facilities at the highest benefit quartile.

Turnover rates were also lower for Kansas facilities that had a higher proportion of total expenditures related to employee benefits:

- Among all nursing staff, average turnover was 94 percent for facilities in the lowest benefit quartile, 91 percent for those in the second quartile, 79 percent for the third quartile, and 76 percent for facilities in the highest quartile (Table 4.9).

- Among individual types of nursing staff, benefit levels appeared to have the strongest relationship to turnover among nurse aides. Average turnover for nurse aides was 107 percent for facilities in the lowest benefit quartile and 104 percent for facilities in the second quartile. Turnover was considerably lower for facilities in either of the two highest benefit quartiles — 88 percent for the third quartile and 93 percent for the fourth quartile. Turnover rates for RNs and LPNs were also lower for facilities in the highest benefit quartile than for facilities in the lowest quartile.

Table 4.6
Turnover and Staff Continuity By Wage Quartile: California

	Wage Quartile			
	1-25th	26-50th	51-75th	76th-99th
Employee turnover percentage				
Direct nursing employees	72.5%	75.6%	70.5%	69.9%
Nurse aide	83.8%	79.3%	74.3%	73.1%
Percentage of employees with continuous service throughout the year				
Direct nursing employees	31.5%	33.9%	38.1%	37.4%
Nurse aide	21.0%	23.5%	24.6%	23.4%

Notes: N=1,139

Sources: State of California, Office of Statewide Health Planning and Development,
Long-Term Care Facility Annual Financial Data, 1999

Table 4.7
Turnover Rates by Wage Quartile: Kansas

	Wage Quartile			
	1-25th	26-50th	51-75th	76th-99th
Employee turnover percentage				
RN	55.1%	46.7%	51.3%	63.5%
LPN	55.2%	52.9%	60.3%	63.4%
Nurse aide	96.4%	106.1%	84.9%	107.2%

Notes: N=252

Sources: KansasDepartment of Aging, Medicaid Cost Report Data, 1999

Table 4.8
Turnover and Staff Continuity By Benefit Quartile: California

	Benefit Quartile			
	1-25th	26-50th	51-75th	76th-99th
Employee turnover percentage				
Direct nursing employees	83.6%	73.3%	71.2%	63.1%
Nurse aide	89.4%	79.9%	76.8%	66.8%
Percentage of employees with continuous service throughout the year				
Direct nursing employees	31.1%	35.4%	36.4%	38.3%
Nurse aide	19.1%	22.8%	23.4%	25.1%

Notes: N=1,139

Sources: State of California, Office of Statewide Health Planning and Development,
Long-Term Care Facility Annual Financial Data, 1999

Table 4.9
Turnover Rates by Benefit Quartile: Kansas

	Benefit Quartile			
	1-25th	26-50th	51-75th	76th-99th
Employee turnover percentage				
All nursing staff	93.9%	90.8%	78.5%	75.8%
RN	55.7%	52.1%	56.9%	52.2%
LPN	62.4%	51.3%	63.8%	58.9%
Nurse aide	106.9%	104.2%	88.4%	92.6%

Notes: N=252

Sources: KansasDepartment of Aging, Medicaid Cost Report Data, 1999

4.6.5 Variation in Turnover Rates Within Cities

There was a great deal of variation in turnover rates for facilities within the same city, suggesting that local labor market conditions or other area-specific factors are not as important as facility-specific factors in accounting for differences in turnover rates. Tables 4.10 – 4.15 show turnover rates by city, for cities with a minimum number of nursing facilities in each of the three states. Note that although these tables report statistics aggregated to the city level, we also analyzed the distribution of turnover rates at the zip code level to select facilities for the site visits described in Chapter 5.[11] This analysis indicated that there was also considerable variation in turnover at the zip code level, providing further evidence that local labor market conditions cannot explain facility differences in turnover levels.

California

- In Long Beach California, one of two California cities that was visited to explore the reasons for facility differences in turnover rates (see Chapter 5), the average turnover rate for direct nursing staff was 88 percent (Table 4.10). Turnover rates for facilities in the city ranged from 24 percent to 168 percent, and the inter-quartile range was 54 to 109 percent.

- In Fresno, the other California city that was visited as part of our site visits, turnover was lower than for Long Beach, but direct nursing turnover ranged from 30 percent to 124 percent.

- In all but 4 of the California cities with 8 or more facilities, one or more facilities had a turnover rate of 100 percent or higher. In all but four cities, at least one facility had a turnover rate of 35 percent or less.

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[11] Chapter 5 reports the results of site visits to high and low turnover facilities within particular labor markets, addressing the role of facility leadership, management practices, and other facility-specific factors in explaining facility differences in turnover within particular labor markets.

- In the majority of California cities, the top quartile of facilities had nurse aide turnover of 100 percent or higher (Table 4.11). For many of these cities, nurse aide turnover for the lowest quartile of facilities was 50 percent or less.

- Similar variation was found in the staff retention measure. For example, in San Francisco, 25 percent of nursing homes had direct nursing staff retention of 18 percent or less, while 25 percent had retention of at least 51 percent (Table 4. 12). Two facilities in San Francisco had staff retention of more than 70 percent. In San Francisco, retention for nurse aides was 11 percent or less for the lowest quartile of facilities, compared to 36 percent of more for the highest quartile (Table 4.13).

- For most California cities, at least one facility had nurse aide retention of 40 percent or more. Bakersfield, however, was the only city for which at least one nursing home did not have nursing home retention of 12 percent or less. Also, for most cities, the lowest quartile of facilities had nurse aide retention of less than 15 percent.

Kansas

- There were few cities in Kansas that had four or more nursing homes, but there was considerable variance in reported turnover levels in these cities. In Olathe, the Kansas town that was visited as part of our site visits, overall turnover (across RNs, LPNs, and nurse aides) ranged from 26 to 157 percent (Table 4.14). Similar variation was found in other Kansas cities.

- For all of the cities in Kansas that are examined on Table 4.14, at least 25 percent of facilities reported overall turnover of more than 100 percent. For most cities, the lowest quartile of facilities reported turnover of 65 percent or less.

- Average turnover levels were considerably higher in Topeka and Wichita than in other towns.

Wisconsin

- Similar to California and Kansas, there was considerable variation in turnover levels within cities. In Milwaukee, the Wisconsin city that was visited as part of the site visits, overall reported turnover was 48 percent or less for the lowest quartile of facilities and 106 percent or more for the highest quartile (Table 4.15).

- Only three of the Wisconsin MSAs that we examined did not have one or more facility with overall turnover of 100 percent or more. All of the MSAs had at least one facility with overall turnover of 45 percent or less.

Table 4.10:

Direct Nursing Turnover Statistics for California Cities

City	Number	Average Turnover	Minimum	Percentile					Maximum
				10th	25th	50TH	75TH	90TH	
ANAHEIM	14	81.5	22	31	52	79	107	131	150
BAKERSFIELD	9	62.6	39	39	52	59	77	87	87
CARMICHAEL	9	62.9	18	18	33	54	93	118	118
EL CAJON	13	81.0	41	44	57	73	110	139	143
EL MONTE	10	69.0	34	34	45	64	82	149	155
ESCONDIDO	8	61.8	18	18	39	56	92	109	109
FRESNO	22	67.7	30	36	48	67	87	94	124
GLENDALE	14	45.5	15	18	24	37	73	79	80
HAYWARD	14	65.0	23	25	34	51	77	158	169
LA MESA	8	84.9	32	32	50	79	125	131	131
LONG BEACH	26	87.7	24	44	54	78	109	168	183
LOS ANGELES	74	64.3	8	25	38	60	86	112	138
MODESTO	11	84.5	44	48	63	80	112	118	119
NORTH HOLLYWOOD	8	50.3	15	15	38	49	67	86	86
OAKLAND	20	85.0	34	36	51	75	114	152	200
PASADENA	16	79.2	14	26	43	76	103	158	176
POMONA	10	77.0	40	41	47	55	108	174	179
RIVERSIDE	17	93.1	29	39	47	78	126	204	220
SACRAMENTO	24	87.2	25	30	49	76	107	176	208
SAN BERNARDINO	10	90.2	38	38	56	81	130	153	153
SAN DIEGO	24	60.5	26	27	34	55	85	106	110
SAN FRANCISCO	19	56.6	13	24	33	49	81	96	106
SAN JOSE	19	74.3	26	26	41	74	100	132	161
SAN RAFAEL	9	71.3	18	18	47	80	95	126	126
SANTA ANA	9	50.7	27	27	29	52	65	89	89
SANTA BARBARA	9	70.2	15	15	45	74	96	115	115
SANTA MONICA	11	53.0	18	22	37	55	62	97	103
STOCKTON	15	52.9	17	21	32	43	59	118	197
TORRANCE	10	69.0	35	35	39	54	83	161	165

Notes: Table 4.10 includes statistics for cities with eight or more nursing homes.

Table 4.11:

Nurse Aide Turnover Statistics for California Cities

City	Number	Average Turnover	Minimum	Percentile					Maximum
				10th	25th	50th	75th	90th	
ANAHEIM	14	84.5	10	24	61	85	107	139	156
BAKERSFIELD	9	58.2	29	29	43	53	79	81	81
CARMICHAEL	9	72.0	20	20	41	56	114	145	145
EL CAJON	13	95.5	37	42	51	70	136	206	210
EL MONTE	10	70.1	37	37	38	67	94	126	129
ESCONDIDO	8	68.8	31	31	43	56	79	163	163
FRESNO	23	65.4	22	30	45	64	89	104	110
GLENDALE	14	52.1	17	22	31	47	79	92	93
HAYWARD	14	73.1	27	27	30	53	111	166	192
LA MESA	8	90.1	36	36	49	75	145	152	152
LONG BEACH	26	91.3	29	37	58	80	120	164	193
LOS ANGELES	74	71.8	10	25	40	63	100	135	193
MODESTO	11	97.4	61	61	71	95	121	133	134
NORTH HOLLYWOOD	8	55.6	18	18	34	58	76	87	87
OAKLAND	21	106.2	19	39	66	91	140	190	279
PASADENA	16	87.6	15	28	45	78	100	193	219
POMONA	10	79.3	25	26	43	55	109	195	196
RIVERSIDE	17	112.1	43	44	49	94	156	236	276
SACRAMENTO	24	90.1	21	31	50	74	124	189	235
SAN BERNARDINO	10	93.5	38	38	49	97	134	164	167
SAN DIEGO	24	65.8	21	28	38	65	92	113	122
SAN FRANCISCO	19	56.7	12	16	32	57	79	92	100
SAN JOSE	19	80.3	18	22	49	69	106	171	215
SAN RAFAEL	9	71.7	22	22	38	69	108	124	124
SANTA ANA	9	53.0	18	18	35	46	79	91	91
SANTA BARBARA	9	60.1	14	14	41	46	82	131	131
SANTA MONICA	11	61.4	31	31	35	60	85	112	114
STOCKTON	15	53.6	5	19	29	44	65	119	196
TORRANCE	10	91.4	31	32	52	74	134	203	210

Notes: Table 4.11 includes statistics for cities with eight or more nursing homes.

Table 4.12:
Direct Nursing Staff Continuity Statistics for California Cities

City	Number	Average Turnover	Minimum	Percentile 10th	25th	50TH	75TH	90TH	Maximum
ANAHEIM	14	36.1	14	17	21	38	48	60	65
BAKERSFIELD	9	52.3	26	26	42	52	65	68	68
CARMICHAEL	9	39.1	9	9	19	38	50	93	93
EL CAJON	13	34.0	12	14	17	24	42	89	95
EL MONTE	10	29.1	20	20	21	24	34	55	56
ESCONDIDO	8	33.0	13	13	14	25	43	88	88
FRESNO	22	37.0	9	13	21	34	49	66	91
GLENDALE	14	32.3	12	14	20	25	44	69	75
HAYWARD	14	31.9	12	14	19	31	43	55	56
LA MESA	8	33.3	8	8	22	31	46	61	61
LONG BEACH	26	32.3	3	17	22	31	42	52	66
LOS ANGELES	72	34.8	13	17	23	31	41	63	91
MODESTO	10	40.5	15	15	21	39	59	75	76
NORTH HOLLYWOOD	8	37.5	13	13	15	28	59	97	97
OAKLAND	20	27.5	6	10	17	25	37	52	64
PASADENA	16	27.8	15	16	22	27	34	43	44
POMONA	10	35.6	14	14	21	34	42	77	80
RIVERSIDE	17	29.8	10	10	16	29	36	60	67
SACRAMENTO	24	34.6	10	13	19	27	47	72	82
SAN BERNARDINO	10	29.5	17	17	21	31	37	40	40
SAN DIEGO	22	35.8	10	14	23	30	47	63	81
SAN FRANCISCO	20	34.5	14	14	18	29	51	71	72
SAN JOSE	19	41.5	10	11	20	35	54	93	96
SAN RAFAEL	9	38.9	19	19	28	29	47	97	97
SANTA ANA	8	42.4	4	4	25	44	62	75	75
SANTA BARBARA	9	37.0	10	10	23	36	50	66	66
SANTA MONICA	11	23.8	8	9	17	19	24	69	79
STOCKTON	15	49.1	12	20	36	50	57	84	97
TORRANCE	10	44.1	18	19	26	33	70	71	71

Notes: Table 4.12 includes statistics for cities with eight or more nursing homes.

Table 4.13:
Nurse Aide Continuity Statistics for California Cities

City	Number	Average Turnover	Minimum	Percentile					Maximum
				10th	25th	50TH	75TH	90TH	
ANAHEIM	14	22.1	9	9	12	23	31	38	38
BAKERSFIELD	9	36.3	18	18	30	41	43	43	43
CARMICHAEL	9	24.3	6	6	17	23	29	53	53
EL CAJON	13	19.3	5	6	10	16	24	49	55
EL MONTE	10	17.7	12	12	15	16	18	34	35
ESCONDIDO	8	20.9	6	6	10	14	28	60	60
FRESNO	23	24.4	6	6	13	22	34	45	56
GLENDALE	14	21.7	9	10	13	17	31	48	59
HAYWARD	14	19.6	7	7	11	19	28	35	38
LA MESA	8	20.4	6	6	13	18	28	43	43
LONG BEACH	26	20.1	2	11	14	19	26	31	49
LOS ANGELES	72	23.0	6	10	14	21	30	38	60
MODESTO	10	26.0	10	10	12	25	40	47	47
NORTH HOLLYWOOD	8	20.1	7	7	10	19	29	40	40
OAKLAND	21	16.9	2	5	9	15	24	32	43
PASADENA	16	18.8	10	11	13	19	25	27	29
POMONA	10	20.5	7	7	14	18	26	44	45
RIVERSIDE	17	18.1	5	6	11	18	23	34	37
SACRAMENTO	24	22.5	6	9	12	19	29	48	58
SAN BERNARDINO	10	18.8	10	10	12	19	26	27	27
SAN DIEGO	22	22.4	5	5	13	18	32	42	56
SAN FRANCISCO	20	22.6	8	9	11	17	36	48	49
SAN JOSE	19	25.9	7	8	14	21	34	59	63
SAN RAFAEL	9	25.7	11	11	16	19	31	66	66
SANTA ANA	8	28.4	8	8	16	30	42	49	49
SANTA BARBARA	9	24.8	5	5	17	24	33	45	45
SANTA MONICA	11	15.1	7	7	10	11	15	46	53
STOCKTON	15	32.4	9	12	24	30	39	57	71
TORRANCE	10	27.2	11	12	19	24	36	50	51

Notes: Table 4.13 includes statistics for cities with eight or more nursing homes.

Table 4.14:
Turnover Statistics for Kansas Cities

City	Number	Average Turnover	Minimum	Percentile			
				25th	50th	75th	Maximum
Emporia	4	94.8	48	54	78	152	174
Hutchinson	5	82.9	55	58	64	117	162
Manhattan	4	105.7	54	62	109	147	152
Newton	4	84.7	62	65	82	107	113
Olathe	5	105.1	26	61	98	153	157
Overland Park	7	81.1	50	59	71	107	118
Parsons	4	94.9	32	44	95	146	158
Salina	6	123.2	22	40	118	186	280
Topeka	21	121.8	10	80	110	169	275
Wichita	11	135.8	56	110	141	175	197

Notes: Table 4.14 includes statistics for cities with four or more nursing homes. Average turnover is calculated across RNs, LPNs, and nurse aides.

Sources: Kansas Department of Aging, Medicaid Cost Report Data, 1999

Table 4.15:
Turnover Statistics for Wisconsin Cities

City	Number	Average Turnover	Minimum	Percentile			
				25th	50th	75th	Maximum
APPLETON	7	62.2	24	25	58	84	134
FOND DU LAC	8	66.4	45	49	59	88	106
GREEN BAY	14	66.9	25	53	60	87	109
JANESVILLE	5	42.9	24	25	35	64	72
KENOSHA	8	91.6	31	79	90	118	125
LA CROSSE	5	49.3	24	34	55	62	63
MADISON	11	108.1	36	69	108	136	232
MANITOWOC	7	52.0	7	28	35	79	135
MILWAUKEE	43	80.2	12	48	70	106	228
RACINE	7	55.4	23	43	47	73	91
SHEBOYGAN	6	78.5	26	33	73	118	159
SUPERIOR	5	62.1	22	29	37	108	114
WAUKESHA	5	82.8	42	42	103	113	115
WEST ALLIS	6	89.4	40	57	85	128	139

Notes: Table 4.15 includes statistics for cities with five or more nursing homes. Average turnover is calculated across RNs, LPNs, and nurse aides.

Source: Wisconsin Division of Health Care Financing, Bureau of Health Information, Annual Survey of Nursing Home, 1999

4.6.6 Regression Results

We estimated a series of multivariate regression models to estimate the relationship between turnover and staff retention (for California, the only state for which staff retention data were available) and facility characteristics, wage, benefit and staffing levels, and local labor market characteristics. Because of differences across states in how turnover was calculated, the data sources for turnover, and the available independent variables, we estimated separate models for each state. Also, because of a relatively low match rate of the facility workload variable to the California cost report data that was used to create the other independent variables, we estimated two series of regressions for California—one that excluded the workload variable and a second set of models that included the facility workload variable but excluded the facilities for which we were not able to match the workload score. For California, we were also able to analyze staff retention in addition to turnover. For these models, retention was defined as the proportion of staff employed at the facility throughout the entire period covered by the cost report.

California:

Wage and benefit levels

Benefits were significantly related to turnover. Evidence was mixed regarding the impact of wage rates on turnover. Among all direct nursing staff, wage rates[12] were not significantly related to turnover (Table 4.16). This may be because the average wage rate figure used in these models reflects a combination of the staffing mix at the facility and actual hourly wage rates (e.g., facilities that have a higher proportion of more highly paid RNs will tend to have a higher overall wage rate even if the actual hourly wage rate paid to staff are not any higher).

Among nurse aides, turnover was significantly lower at facilities with higher nurse aide wage rates, although the magnitude of the estimated impact was small. Relative to facilities in the lowest wage rate quartile, turnover was more than 10 percent lower for facilities in the third quartile and 19 percent lower for facilities in the highest quartile (Table 4.17). Both of these differences were statistically significant at the 1 percent level.

For both direct nursing staff and nurse aides, there was a strong and statistically significant relationship between benefit levels and turnover. Average turnover across all direct nursing care staff was 18 percent lower at facilities in the top quartile in terms of benefit levels than at facilities in the lowest benefit quartile (Table 4.16). Turnover was 11 percent lower for facilities in the third highest benefit quartile and 9 percent lower for facilities in the second highest quartile. All of these differences were statistically significant at the 1 percent level.

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[12] Note that all wage rate figures used in the regression models are adjusted for differences in cost of living across different parts of the state as described in Section 4.

A similar relationship was observed for the subset of nurse aides. Average turnover for facilities in the top quartile in terms of benefit levels was 18 percent lower than for facilities in the lowest quartile (Table 4.17). Turnover was also significantly lower for facilities in the second or third quartiles than for facilities in the lowest quartile.

Facilities with high turnover tended to have low staff retention, although there were exceptions. As a result, regression results for the staff retention measures were in general consistent with those for the turnover models. Facilities that paid higher wage rates had higher staff retention than other facilities. Among direct nursing staff, retention was about 3 percentage points higher than for facilities in the lowest wage quartile, a difference that was statistically significant at the 5 percent level (Table 4.18). For nurse aides, retention was significantly higher among facilities with above average wage rates. Relative to facilities in the lowest nurse aide wage rate quartile, retention was 1.5 percentage points higher for facilities in the third quartile and more than 2 points higher for facilities in the highest quartile (Table 4.19).

Consistent with results from the turnover models, we found a strong relationship between retention and facility benefit expenditures. For direct nursing staff, compared to facilities in the lowest benefit quartile, retention was 4.4 percent higher among facilities in the second quartile, 5.6 percent higher for those in the third quartile, and 7 percent higher for facilities in the highest quartile (Table 4.19). A similar pattern was observed for the subset of nurse aides—nurse aide retention was significantly higher at facilities with higher benefit expenditures.

Staffing levels

Across all direct care staff, there was no relationship between total nursing hours per resident day and turnover. Among nurse aides, turnover was lower at facilities that had more nurse aide hours per resident day. A one hour change in nurse aides per resident day was associated with a 4 percent decrease in turnover, a difference that was statistically significant at the 10 percent level (Table 4.17). Similarly, while there was no relationship between facility staffing levels and retention among direct nursing staff, nurse aide retention was significantly higher at facilities with more nurse aide staffing. A one hour change in nurse aides per resident day was associated with a 1 percent increase in retention (Table 4.19).

Facility characteristics

Among both all direct nursing care staff and the subset of nurse aides, turnover was significantly higher at for-profit facilities, other factors held constant. Among both direct nursing care staff and the subset of nurse aides, turnover was more than 16 percent higher at for-profit facilities. There was no difference in turnover rates between nursing home chains and independent facilities.

Turnover was significantly lower at large nursing facilities. Among direct nursing care staff, the turnover percentage was 15 percent lower at facilities with 200 or more beds, relative to facilities with less than 100 beds (Table 4.16). It was 11 percent lower at facilities with between 100 and 199 beds. Both of these differences were statistically significant at the 1 percent level. A similar pattern was observed for nurse aides—turnover was 17 percent lower at facilities with 200 or more beds and nearly 10 percent lower for facilities with between 100 and 199 beds, relative to smaller nursing homes with less than 100 beds (Table 4.17).

Retention for both all direct nursing staff and the subset of nurse aides was much higher at larger facilities. Adjusting for the other variables in the model, direct nursing retention was 24 percent higher at facilities with 100-199 beds and 40 percent higher at facilities with more than 200 beds than at facilities with fewer than 100 beds (Table 4.18). Among nurse aides, compared to facilities with fewer than 100 beds, retention was 15 percent higher at facilities with 100-199 beds and 31 percent higher at facilities with 200 or more beds (Table 4.19). These differences were statistically significant at the 1 percent level.

Facility size was by far the best predictor of facility retention rates. Because of the strong relationship between facility size and retention, the statistical performance of the retention models was superior to that of the California turnover models. Our models accounted for more than 45 percent of the variance in retention rates, compared to less than 10 percent of the variance in turnover for either direct nursing staff or nurse aides.

Local labor market characteristics

Among direct nursing care staff, there was no difference in turnover rates between facilities in urban counties, rural counties, and counties that are adjacent to urban areas. Nurse aide turnover was significantly (at the 10 percent level) higher for urban facilities, relative to rural facilities, perhaps reflecting the larger number of nursing homes that are found in urban counties.

There was no relationship between county unemployment rates and turnover or retention, either for all direct nursing care staff or the subset of nurse aides. Turnover rates, however, were higher for facilities in counties with higher per capita income. Relative to counties in the lowest quartile in terms of per capita income, turnover among nurse aides was 35 percent higher in counties in any of the three highest quartiles. All of these differences were statistically significant at the five percent level or higher. This relationship likely reflects the greater potential access to higher paying jobs in counties with higher per capita income levels. Consistent with this hypothesis, direct nursing staff retention was significantly lower for facilities in counties with higher per capita income levels. Relative to counties in the lowest quartile, retention was almost 11 percent lower in counties in the third quartile and nearly 8 percent lower for counties in the highest per capita income quartile (Table 4.18). These differences were statistically significant.

Table 4.16:

California Regression Models: Turnover Percentage, Direct Nursing Care Staff, 1999

Variable	Parameter Estimate	Standard Error	T statistic
Intercept	52.31 ***	11.50	4.55
Total nursing hours per resident day	1.49	1.25	1.19
100 or more beds	-10.91 ***	2.55	-4.28
200 or more beds	-15.40 ***	5.43	-2.84
Average wage rate: Second quartile	2.60	3.10	0.84
Average wage rate: Third quartile	-1.81	3.27	-0.56
Average wage rate: Top quartile	-5.80	3.90	-1.49
Fringe benefit percentage: Second quartile	-9.19 ***	3.11	-2.96
Fringe benefit percentage: Third quartile	-10.93 ***	3.22	-3.40
Fringe benefit percentage: Top quartile	-17.78 ***	3.36	-5.29
For-profit facility	16.56 ***	3.57	4.64
Chain facility	-0.37	2.65	-0.14
Urban county	2.64	5.93	0.45
Adjacent to urban county	6.27	7.94	0.79
County unemployment rate: Second quartile	-4.20	5.06	-0.83
County unemployment rate: Third quartile	4.26	10.98	0.39
County unemployment rate: Top quartile	-30.96	22.07	-1.40
Per capita income: Second quartile	18.82 *	10.15	1.86
Per capita income: Third quartile	17.98	14.28	1.26
Per capita income: Top quartile	19.57	11.89	1.65

Notes: N= 1,157 R-squared: 0.096

***: Statistically significant at 1 percent level
**: Statistically significant at 5 percent level;
*: Statistically significant at 10 percent level;

Sources: State of California, Office of Statewide Health Planning and Development . Long-Term Care Facility Annual Financial Data, 1999

Table 4.17:
California Regression Models: Turnover Percentage, Nurse Aides, 1999

Variable	Parameter Estimate	Standard Error	T statistic
Intercept	63.83 ***	13.87	4.60
Nurse aide hours per resident day	-4.25 *	2.48	-1.72
100 or more beds	-9.78 ***	3.00	-3.26
200 or more beds	-17.01 ***	6.47	-2.63
Nurse aide wage: Second quartile	-3.31	3.70	-0.89
Nurse aide wage: Third quartile	-10.52 ***	4.06	-2.59
Nurse aide wage: Top quartile	-18.56 ***	4.87	-3.82
Fringe benefit percentage: Second quartile	-9.09 **	3.66	-2.49
Fringe benefit percentage: Third quartile	-10.31 ***	3.84	-2.69
Fringe benefit percentage: Top quartile	-18.32 ***	4.00	-4.58
For-profit facility	15.90 ***	4.27	3.72
Chain facility	-4.14	3.13	-1.32
Urban county	12.32 *	7.00	1.76
Adjacent to urban county	9.35	9.42	0.99
County unemployment rate: Second quartile	-7.02	6.02	-1.17
County unemployment rate: Third quartile	8.39	13.00	0.65
County unemployment rate: Top quartile	-32.52	26.36	-1.23
Per capita income: Second quartile	34.87 ***	12.10	2.88
Per capita income: Third quartile	35.04 **	17.16	2.04
Per capita income: Top quartile	34.63 **	14.27	2.43

Notes: N= 1,129 R-squared: 0.484

***: Statistically significant at 1 percent level
**: Statistically significant at 5 percent level;
*: Statistically significant at 10 percent level;

Sources: State of California, Office of Statewide Health Planning and Development , Long-Term Care Facility Annual Financial Data, 1999